Office 24

METEOROLOGICAL OFFICE
27 OCT 1966
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MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL.

1894—1895.

LONDON:
PRINTED FOR HER MAJESTY'S STATIONERY OFFICE,
BY EYRE AND SPOTTISWOODE,
PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY.

1896.

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Office

MINUTES OF THE PROCEEDINGS

OF THE

METEOROLOGICAL COUNCIL.

1894—95.

63, *Victoria Street*, *April* 4, 1894.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. STONE. | THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (March 21) were read and confirmed.

The subject of the Report for the past year was considered, and Mr. Scott was instructed to prepare a Draft Report by next meeting.

The following increments of salaries to the Office staff were allowed.

	Salary in 1893–94.	Proposed for 1894–95.
	ANNUAL.	
CLASS I.—MAXIMUM 275*l.*	£ *s.* *d.*	£ *s.* *d.*
J. A. Curtis (Minutes, 1884–5, p. 118) - - - -	250 0 0	255 0 0
J. E. Cullum („ 1886–7, p. 98) - - - -	255 0 0	260 0 0
CLASS IV.—MAXIMUM 110*l.*		
F. W. Snell (Minutes, 1888–9, p. 107) - - - -	100 0 0	105 0 0
C. W. Heinemann (Minutes, 1886–7, p. 98) - - -	90 0 0	95 0 0
L. H. Powers („ 1887–8, p. 120) - - -	80 0 0	85 0 0
C. A. Bracey („ 1890–1, p. 76) - - -	70 0 0	75 0 0
E. J. Hood („ 1892–3, p. 66) - - -	60 0 0	65 0 0
OFFICE KEEPER.—MAXIMUM 80*l.*		
W. H. Parsons (Minutes, 1893–4, p. 13) - - - -	60 0 0	65 0 0
	WEEKLY.	
FEMALE CLERKS.—MAXIMUM 1*l.* 10*s.* 0*d.*		
M. E. Anderson (Minutes, 1891–2, p. 7) - - - -	1 6 0	1 8 0
R. E. Smith („ „) - - - -	1 4 0	1 6 0
A. E. Mansford („ 1893–4, p. 19) - - - -	1 2 0	1 4 0
BOY CLERKS.—MAXIMUM 1*l.*		
F. E. Dash (Minutes, 1890–1, p. 35; 1891–2, p. 7) - -	0 18 6	1 0 0
H. A. Hewitt „ „ - - -	0 18 6	1 0 0
A. H. Brown „ „ - - -	0 17 0	0 18 6
A. H. Rigby „ „ - - -	0 15 6	0 17 0
J. R. Schuymer „ 1893–4 p. 78) - -	0 12 6	0 14 0

C. E. Goad, messenger, to receive 18*s.* 6*d.* a week instead of 17*s.* as hitherto.

Letters were read from several members of the staff, requesting the Council either to grant increases of salary beyond the maximum fixed for their respective classes, or to increase the Office staff.

The Council expressed their regret that it was impossible for them to increase the scale of establishment at present authorised.

E 81252. 25.—5/94. Wt.

Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of February 1894:—

The letters used have the following signification:—

a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

FEBRUARY 1894.

Districts.		Per-centages. Wind.	Weather.	Average Forecast.	Per-centage of Success. a + b.
Scotland, N.	a	46	75	61	86
,,	b	29	21	25	
,,	c	14	0	7	
,,	d	11	4	7	
Scotland, E.	a	32	61	47	81
,,	b	36	32	34	
,,	c	21	7	14	
,,	d	11	0	5	
England, N.E.	a	54	61	58	85
,,	b	25	29	27	
,,	c	18	7	12	
,,	d	3	3	3	
England, E.	a	57	57	57	84
,,	b	18	36	27	
,,	c	21	4	13	
,,	d	4	3	3	
Midland Counties	a	54	57	56	84
,,	b	25	32	28	
,,	c	14	4	9	
,,	d	7	7	7	
England, S.	a	61	61	61	85
,,	b	18	29	24	
,,	c	21	7	14	
,,	d	0	3	1	
Scotland, W.	a	43	75	59	79
,,	b	18	21	20	
,,	c	32	4	18	
,,	d	7	0	3	
England, N.W.	a	50	75	63	86
,,	b	32	14	23	
,,	c	14	11	12	
,,	d	4	0	2	
England, S.W.	a	68	71	70	86
,,	b	14	18	16	
,,	c	11	11	11	
,,	d	7	0	3	
Ireland, N.	a	57	75	66	88
,,	b	25	18	22	
,,	c	7	7	7	
,,	d	11	0	5	
Ireland, S.	a	46	68	57	84
,,	b	29	25	27	
,,	c	21	7	14	
,,	d	4	0	2	
Summary.					
British Isles	a	52	67	60	84
,,	b	24	25	24	
,,	c	18	6	12	
,,	d	6	2	4	

Submitted—The following reports of work during the month of March 1894:—

MARINE BRANCH.

April 3, 1894.

Examined 10 new logs and four lighthouse registers.

Form of chart for publishing the wind results for the district between the Cape of Good Hope and New Zealand passed for press. Tabulating fogs recorded in the same district.

Preparing the data in Office logs for the district south of the Equator, between the west coast of Africa and longitude 90° W., and extracting the Atlantic equatorial observations to latitude 10° S.

With the exception of the chart for December the current charts for the Red Sea district have been passed for press. Monthly mean air temperatures have been obtained for several coast stations on both sides of the Red Sea and the Gulf of Aden for publishing on the wind charts.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.
(To 31st March 1894.)

Weekly Weather Report, 1893.—Completed and issued.
Do. do. 1894.—All numbers issued to date. Quarterly Summary (Appendix I.) for January—March well in hand.
Monthly Summaries.—January issued. February in proof.
Daily Weather Report, 1894.—All numbers issued to date.
Storm Warnings issued 1894.—Primary checking done to date.
Do. do. 1893.—Final checking is now in progress.
Daily (8.30 *p.m.*) *Forecasts.*—Checking done up to February.
New Rainfall Publication.—In progress. All the returns for the decade 1881–90 are now in hand, and most of these for decade 1871–80.

The first sheet of Part I. is in proof and "copy" for another half-sheet is in printer's hands.

(Signed) FREDC. GASTER.

Telegraphic Branch,
April 4, 1894.

PANTAGRAPH ROOM.

April 2, 1894.

Hourly Means.—The hourly tabulations of sunshine for Fort William for the year 1891 have been made, and the tables of mean values of direction and frequency calculated; the "frequency" tables for the other five observatories for the same year have also been prepared.

The calculation of the "frequency" values for the seven observatories for the 10 years 1881–90 is now in hand.

The routine work of the Room has been kept up to date.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

April 2, 1894.

Examinations.

June, 1893.—Completed.
July and August, 1893.—Proceeded with.
Weekly examination (on receipt) of curves and documents from all observatories.

Reports.

May and June, 1893.—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.
January—June, 1893.—Tabular reports for each month and combined report for Council.

Miscellaneous.

Diurnal Range of Rainfall, 1871–1890.—Examination and correction of the hourly values, &c., proceeded with.

(Signed) T. E. ALLEN.

Submitted :—The following statement respecting the Records for January to June, 1893, received from the Self-recording Observatories (see Minutes, 21st December, 1868; 20th November, 1876; 3rd January, 1883; and 6th March, 1889) :—

JANUARY-JUNE.	ABERDEEN.		ARMAGH.		FALMOUTH.		FORT WILLIAM.		KEW.		VALENCIA.	
ANEMOGRAPH :—	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.
Action of Instrument -	Good.	Good.	Good.	Good to Fair.	Good.	Good.	—	—	Good.	Good.	Good.	Good.
Records deficient :—												
Due to stoppage of clock	0	0	38 hrs.	41 hrs.	0	0	—	—	0	0	4 hrs.	4 hrs.
„ other causes -	0	0	6 hrs.	14 hrs.	0	0	—	—	0	0	9 hrs.	8 hrs.
No. of errors discovered :—												
By general examination	2	2	25	15	3	1	—	—	0	0	4	2
Rslts. of 40 Remeasmnts. :—												
Greatest difference -	1·0	1·0	1·0	1·0	1·0	1·0	—	—	1·0	1·0	1·0	1·0
Mn. diff. irrespctv. of sign	0·2	0·3	0·1	0·3	0·2	0·3	—	—	0·1	0·2	0·1	0·3
Residual diff. (− M. O.) -	0·0	0·0	0·0	+0·1	0·0	0·0	—	—	+0·1	0·0	+0·1	+0·1
Orientation verified -	Monthly	—	Monthly	—	Monthly	—	—	—	Monthly	—	Monthly	—
RAIN-GAUGE :—												
Action of Instrument -	Good.		Good.		Good.		Good to Indifferent.		Good.		Good.	
Records deficient :—												
Due to stoppage of clock	0		7 hrs.		0		4 hrs.		0		10 hrs.	
„ other causes -	0		24 hrs.		0		0		0		0	
No. of errors discovered :—												
By general examination	2		0		2		4		3		5	

——	ABERDEEN.	FALMOUTH.	FORT WILLIAM.	KEW.	VALENCIA.
BAROGRAPH :—					
Action of Instrument -	Good.	Good.	Good.	Good.	Good.
Character of Photography	Do.	Excellent.	Do.	Do.	Do.
Records deficient :—					
Due to stoppage of clock	0	0	0	2 hrs.	0
„ failure of light -	0	0	6 hrs.	0	0
„ other causes -	0	0	0	11 hrs.	5 hrs.
No. of errors discovered :—					
In entry of standards -	0	2	9	1	10
„ calculating residuals -	2	0	3	0	0
„ applying „ -	0	0	6	1	1
„ maxima and minima -	1	4	10	0	6
By general examination -	*23	1	25	2	6
Rslts. of 40 Remeasmnts. :—					
Greatest difference -	·006	·006	·006	·006	·006
Mn. diff. irrespctv. of sign	·002	·002	·002	·002	·002
Residual diff. (− M. O.) -	·000	−·001	·000	·000	·000
Mean monthly diff. between simultaneous Bargph. and Stand. Bar. readings -	·002	·002	·002	·002	·002

THERMOGRAPH :—	ABERDEEN.		FALMOUTH.		FORT WILLIAM.		KEW.		VALENCIA.	
Action of Instrument -	Good.		Good.		Good.		Good.		Good.	
Character of Photography	Do.		Do.		Do.		Do.		Do.	
Records deficient :—	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Due to stoppage of clock	0	0	0	0	11 hrs.	11 hrs.	0	0	9 hrs.	9 hrs.
„ failure of light -	0	0	0	0	10 hrs.	10 hrs	0	0	0	3 hrs.
„ impfctly. moist. bulbs	—	41 hrs.	—	0	—	19 hrs.	—	22 hrs.	—	8 hrs.
„ partlly. frozen bulbs	—	128 hrs.	—	30 hrs.	—	84 hrs.	—	57 hrs.	—	0
„ other causes -	4 hrs.	4 hrs.	0	1 hr.	9 hrs.	8 hrs.	0	0	0	0
No. of errors discovered :—										
In entry of standards -	0	1	1	0	6	12	0	0	4	2
„ maxima and minima -	4	—	0	—	10	—	2	—	2	—
By general examination -	4	0	1	0	19	21	0	2	4	5
Rslts. of 40 Remeasmnts. :—										
Greatest difference -	0·2	0·2	0·2	0·2	0·2	0·6	0·1	0·1	0·2	0·2
Mn. diff. irrespctv. of sign	0·1	0·0	0·1	0·1	0·1	0·2	0·1	0·1	0·1	0·1
Residual diff. (− M. O.)	0·0	0·0	0·0	0·0	0·0	+0·1	0·0	0·0	+0·1	+0·1
Mean monthly diff. between simultaneous Thergph. and Stand. Ther. readings	0·2	0·2	0·2	0·2	0·1	0·2	0·1	0·2	0·2	0·1

* All in June during Mr. Boswell's absence on vacation.

ABERDEEN.

Anemograph.—Action satisfactory throughout. Bearings oiled on the 29th April and 16th June.
Rain Gauge—Working satisfactorily. Agreement with check gauge remarkably good.
Barograph.—Light shutter gave some trouble during the last three months of the period, frequently failing to act; oiled the different parts of the shutter on 16th June.
Thermograph.—Instrument working well throughout. Zero-lines changed from winter to summer positions on 11th May.

ARMAGH.

Anemograph.—The velocity traces are intermittent at low rates in consequence of a mechanical defect. On 9th February one of the cups was blown off during the night, but was replaced on the following day. The velocities at this station are comparatively low.
Rain Gauge.—The action of this instrument calls for no special mention, and the totals agree well with those by the check gauge.

FALMOUTH.

Anemograph.—Bearings of instrument oiled monthly. Action good.
Rain Gauge.—Early in February (2nd) a slight leakage from the receiver was detected, and was found to be due to the cup not being tightly screwed to its base; the defect was remedied on the same day. During May and June the stated times of beginning and ending of the curve were not in close agreement with the ends of traces.
Barograph.—The action of the instrument left nothing to be desired, and the photography was excellent. The agreement between the readings of the standard barometer and the corresponding tabulated hourly values, as measured on the curves is remarkable.
Thermograph.—The working of this instrument was satisfactory throughout. Zero-lines changed from winter to summer positions on 21st April.

FORT WILLIAM.

Rain Gauge.—This instrument continued to be a source of trouble throughout the period, its working being very erratic with consequent ill-effects upon the hourly values, while the daily amounts as shown by the traces were generally less—at times very much so—than when the rain was measured in the glass. Attention called thereto from time to time but without satisfactory result. On 15th May "cleaned the mercury and friction rollers" but this did not have the desired effect. On 2nd May the instrument was interfered with and there is a note that "children had "been near instrument." Curve 112 was lost.
Barograph.—The tube was raised on the 11th January and replaced on the 14th. On the 6th April "when dusting the barograph, the tube turned round slightly and threw off the light shield."
Thermograph.—The agreement between the measurements of the wet-bulb trace made at the observatory and at the Meteorological Office respectively, is not good, and at times amounts to 0°·5; attention has been drawn thereto. Zero-lines changed from winter to summer positions on 23rd April.

KEW.

Anemograph.—The stated times of beginning and ending of the curves do not agree with the beginning and ending of the traces, owing to the pricker not being satisfactory. Trace of curve No. 96 slightly interfered with "to allow of inspection by visitors." The bearings were oiled monthly.
Rain Gauge.—The satisfactory results given by the Richard aniline ink pen on the Willesden paper continued throughout the period.
Barograph.—The definition of the lower edge of the curve was at times slightly imperfect, probably caused by the light being too strong. The tube was examined on 4th March. Large differences between the measurements made at the observatory and the Meteorological Office led to the suggestion that an alteration had taken place which affected the scale value. (See M.O. 1787, 1893.) Mr. Chree made an exhaustive inquiry into the various causes which enter into the formation of the residuals (see M.O. 5, 1894), and the alteration of the scale value was allowed to be the principal cause of the differences. A re-determination of the scale value was therefore resolved upon.
Thermograph.—The zero line dots were lowed on 31st January and raised again on 6th February; lowered again at 1 p.m. on 8th March, and altered to the summer positions on 19th April. Curve 96–97 was much discoloured through "exposure of instrument to visitors." In April the difficulty of secondary images was partly overcome by toning the lights, and further endeavours were made to reduce stray light in June, but it was found to be not possible without reducing the light perilously low. New wet-bulb upper zero-line value (74° ·8) was used from 11 a.m., 19th April.

VALENCIA.

Anemograph.—At this observatory also, the pricker gave some trouble, causing disagreement with the times. Curve 101 was defaced by visitors. Bearings oiled periodically.
Rain Gauge.—Attention was called to the indifferent attachment of the papers, but the working of the instrument was satisfactory.
Barograph.—At 10 p.m. on 8th March, "Lamp probably moved in its fitting," readjusted at 11.15 a.m. on the 10th. The light stop gave occasional trouble, and on 21st March the bearing was tightened.

Thermograph.—Secondary images of the wet trace were prevalent and interfered somewhat with the definition of the trace; they are caused by a defect of the blackening on the tube. The variation in the breadth of the traces is very marked and is probably caused by the varying intensity of the light. Attention was called thereto and suggestions made for a regular change of lamps at 10 a.m. and 10 p.m. daily. (See P.C. 547, 1894.) By the fitting of new wicks to the lamps on the 24th June the traces were decidedly improved. Zero-lines altered to summer positions on 15th May.

(Signed) T. E. ALLEN.

Mr. Scott reported that he had learned that Mr. Munro was prepared to lend a second anemometer, on Dines' principle, if required, for temporary comparison with the instrument on the roof of the Office, and he was instructed to obtain an estimate for the cost of its erection beside the other.

Reported—That since the last meeting of the Council there had been no Warnings issued, nor had any Gales been experienced on the coasts of the British Islands.

FREDC. GASTER.

Telegraphic Branch,
4th April 1894.

Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 20th March - - -	3,912	3	3
Receipts from 21st March to 3rd April - -	62	6	1
	3,974	9	4
Cheques drawn 21st March to 3rd April	2,519	11	3
Balance on 3rd April - - -	1,454	18	1

Submitted—The following list of publications which had been received since the last meeting:—

Hann, J.—Beiträge zum täglichen Gange der meteorologischen Elemente in den höheren Luftschichten.

Clayton, H. H.—Six and seven day weather periods.

Riggenbach, A.—Witterungs-Übersicht des Jahres 1893.

Fritsche, H.—Die magnetischen Localabweichungen bei Moskau und ihre Beziehungen zur dortigen Local-Attraction.

Dufour, C.—La scintillation des étoiles.

Klossovsky, A.—Le climat d'Odessa d'après les observations de l'observatoire météorologique de l'Université Impériale d'Odessa.

Hamburg, Deutsche Seewarte.—Aus dem Archiv der Deutschen Seewarte. xvi. Jahrg., 1893.

Upsala, Observatoire Météorologigue de l'Université.—Bulletin Mensuel. Vol. xxv. Année 1893.

63, *Victoria Street, April* 18, 1894.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.	MR. STONE.
MR. GALTON.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (April 4) were read and confirmed.

The Draft of the Annual Report was submitted, as directed at last meeting.

The subjoined statistics of Admiralty instruments in stock and at the dockyards as on April 18th were submitted. It was explained that the returns for the foreign dockyards were for the latest date for which they had come in (Hong Kong was much in arrear).

RETURN of ADMIRALTY INSTRUMENTS at the METEOROLOGICAL OFFICE, either available for issue or under Construction or Repair, 1894, April 18th.

	Barometers.		Thermometers.			
	Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Available 1894, January 10th -	—	11	108	19	19	32
Received, new - - -	25	15	200	50	50	—
„ repaired, cleaned, &c. -	10	11	13	3	3	12
	35	37	321	72	72	44
Issued - - - -	19	29	321	70	70	34
Available - - - -	16	8	—	2	2	10
Ordered - - - -	13	—	—	—	—	—
Repairing - - -	23	—	—	—	—	—
Total available and ordered -	52	8	—	2	2	10

RETURN of INSTRUMENTS at HOME DOCKYARDS, as per Information to date.

Date.	Portsmouth.	Barometers.	Aneroids.	Thermometers.	Maximum.	Minimum.	Screens.
April 1st.	Establishment -	23	53	150	50	50	25
	In Store - -	23	53	143	33	35	13
	Deficiency - -	—	—	7	17	15	12

Date.	Devonport.	Barometers.	Aneroids.	Thermometers.	Maximum.	Minimum.	Screens.
April 1st.	Establishment -	22	50	140	45	45	22
	In Store - -	20	45	127	41	41	17
	Deficiency - -	2	5	13	4	4	5

Date.	Chatham.	Barometers.	Aneroids.	Thermometers.	Maximum.	Minimum.	Screens.
	Establishment -	18	54	120	35	35	25
	In Store -	16	42	79	5	8	11
	Deficiency - -	2	12	41	30	27	14

Date.	Sheerness.	Barometers.	Aneroids.	Thermometers.	Maximum.	Minimum.	Screens.
April 1st.	Establishment -	6	22	40	15	15	10
	In Store - -	6	5	35	14	14	9
	Deficiency - -	—	17	5	1	1	1

Reserve of Admiralty Instruments at Meteorological Office.		Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
1894.	Establishment - - -	45	120	250	80	80	50
April 1.	In stock - - - -	16	8	—	2	2	10
„	Deficiency - - - -	29	112	250	78	78	40
„	Deficiency at Portsmouth - -	—	—	7	17	15	12
„	„ Devonport - -	2	5	13	4	4	5
„	„ Chatham - -	2	12	41	30	27	14
„	„ Sheerness - -	—	17	5	1	1	1
„	Total deficiency. Home Yards -	4	34	66	52	47	32
Jan. 1.	Deficiency at Queenstown - -	—	—	—	3	3	—
April 1.	„ Gibraltar - -	—	—	—	—	—	—
„	„ Malta - - -	4	6	27	2	—	—
Jan. 1.	„ Bombay - -	—	—	—	1	1	—
„	„ Halifax - -	2	—	—	—	—	1
„	„ Bermuda - -	—	3	10	—	—	—
„	„ Jamaica - -	—	—	—	—	—	1
„	„ Cape Good Hope -	—	1	—	—	—	—
„	„ Trincomalee - -	1	—	—	1	1	1
	„ Hong Kong* - -	—	—	—	—	—	—
„	„ Coquimbo - -	—	—	—	—	—	—
„	„ Sydney - -	3	1	12	3	3	—
„	„ Esquimalt - -	—	—	—	—	—	1
	Total deficiency. Foreign yards -	10	11	49	10	8	4
	Total deficiency - - -	43	157	365	140	133	74
	Under repair and ordered - -	36	—	—	—	—	—
	Total required - - -	7	157	365	140	133	74

* Returns have not been received for June and September quarters 1893.

18th April 1894.

It was resolved to order :—

	Estimated Cost. £	s.	d.
75 Aneroids - - - - - -	180	0	0
200 Thermometers (ordinary) - - - -	69	10	0
100 Thermometers, Max. and Min. (pairs) - -	130	0	0
50 Screens - - - - - -	26	5	0

Resolved—That a copy of the foregoing statements be forwarded to the Hydrographer.

It was resolved to pay Mr. Symons 100*l.* on account of the cost of the Rain Tables he had supplied. (Minutes, 1893, p. 58.)

Read—Letter 613 from Dr. Rubenson, the Director of the Meteorological Institute of Sweden, requesting the Office to supply him daily with reports from four additional British stations, and explaining that his funds would only suffice for the cost of three messages, so that he requested that the Meteorological Office would supply him with the fourth report *gratis*.

Mr. Scott stated that at present the Office received information from Sweden *gratis*, and made no direct return to Sweden for it. He stated that the estimated cost of the information asked for was 7*d.* a day, or about 10*l.* a year. He was authorised to reply (P.C. 791) that the Council would supply the required report *gratis*, but that they do not want to receive the two additional reports offered by Dr. Rubenson.

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of March 1894:—

The letters used have the following signification :—

a = complete success. | **c** = partial failure.
b = partial (*i.e.*, more than half) success. | **d** = total failure.

MARCH.

Districts.		Per-centages. Wind.	Weather.	Average Forecast.	Per-centage of Success. a + b.
Scotland, N.	a	52	55	54	81
"	b	23	32	27	
"	c	16	7	12	
"	d	9	6	7	
Scotland, E.	a	58	81	70	89
"	b	23	16	19	
"	c	6	3	5	
"	d	13	0	6	
England, N.E.	a	55	74	65	91
"	b	29	23	26	
"	c	13	3	8	
"	d	3	0	1	
England, E.	a	58	71	65	89
"	b	26	23	24	
"	c	16	6	11	
"	d	0	0	0	
Midland Counties	a	55	68	62	85
"	b	23	23	23	
"	c	19	9	14	
"	d	3	0	1	
England, S.	a	55	65	60	88
"	b	26	29	28	
"	c	16	6	11	
"	d	3	0	1	
Scotland, W.	a	52	65	59	78
"	b	22	16	19	
"	c	13	10	11	
"	d	13	9	11	
England, N.W.	a	55	65	60	88
"	b	29	26	28	
"	c	6	6	6	
"	d	10	3	6	
England, S.W.	a	48	58	53	82
"	b	32	26	29	
"	c	10	13	12	
"	d	10	3	6	
Ireland, N.	a	42	61	52	79
"	b	35	20	27	
"	c	10	6	8	
"	d	13	13	13	
Ireland, S.	a	32	52	42	83
"	b	39	42	41	
"	c	19	0	9	
"	d	10	6	8	
Summary.					
British Isles	a	51	65	58	85
"	b	28	25	27	
"	c	13	6	9	
"	d	8	4	6	

Submitted—The following statement of accounts for the year ending 31st March 1894:—

Income.	£ s. d.	£ s. d.	Expenditure.	£ s. d.	£ s. d.
Balance from year 1892–93	- - -	1,099 19 11	Administration:		
Proportion of vote -	- - -	15,300 0 0	Payment of Council -	991 5 0	
Repayment of expenses charged under—			Secretary - -	800 0 0	
(1.) Incidental expenses	3 19 11		Salaries and wages -	903 18 8	
(2.) Observatories -	49 11 7		Rent, fuel, and lighting	703 7 1	
		53 11 6	Furniture and fittings	164 6 2	
			Incidental and contingent expenses -	233 3 2	
			Pensions - -	186 16 4	
					3,982 16 5
Supply of Weather Information:					
D.W. Charts and Forecasts - -	259 5 3		Special Researches:		
6 p.m. Charts - -	25 0 0		Salaries - -	712 11 10	
Information for Press Agencies, &c.	94 19 10		Other charges* -	339 17 7	
Telegrams - -	197 10 9				1,052 9 5
		576 15 10	Land Meteorology:		
			Observatories and stations - -	2,409 11 7	
Sale of Instruments, &c.:			Discussion and reduction of observations -	1,297 2 3	
					3,706 13 10
M.O. account - -	23 11 0		Weather Information and Forecasts:		
Royal Navy account -	1 17 0		Telegraphic reports and storm warnings	2,543 1 11	
Mercantile Marine account - -	28 5 9		Preparation and issue of reports and forecasts - -	1,861 11 3	
		53 13 9			4,404 13 2
Commission charged on work done for Colonies, &c. - -	- - -	5 16 4	Inspections:		
			Salaries and travelling	- - -	589 6 7
			Ocean Meteorology:		
			Discussion and reduction of observations -	1,597 15 0	
			Expenses incidental to the supply of instruments:		
			Proportion for care and issue of instruments -	200 0 0	
			Royal Navy -	807 19 2	
			Mercantile Marine	303 10 8	
			Distant island and coast stations	14 0 8	
					2,923 5 6
			Balance - -	- - -	430 12 5
		£17,089 17 4			£17,089 17 4

Liabilities.	£ s. d.	Assets.	£ s. d.
To Post Office (partly estimated) -	333 14 10	By cash at Bank - - -	1,448 0 5
„ sundry creditors - - -	834 1 4	„ „ at Office - - -	69 12 6
„ balance - - -	430 12 5	„ sundry debtors - - -	80 15 8
	£1,598 8 7		£1,598 8 7

* The total amount due to Mr. Symons for Rain Tables charged here, although payment will probably extend over two years.

Submitted—The following memorandum :—

April 16th, 1894.

HOURLY MEANS of PRESSURE and TEMPERATURE.

SIR,

I HAVE to report that the work of computing and checking the hourly means of pressure and temperature for each calendar month for the several observatories, since the date of their establishment, is now completed, and I shall be glad to receive the instructions of the Council as to the further steps to be taken with the results.

The position of the work, as it stands at present, is as follows :—

Valencia, Aberdeen, Falmouth, Kew	Hourly mean values of pressure and temperature have been calculated for each month but not published for	18 years, 1869–86.
Armagh, Glasgow, Stonyhurst	Do. do. do. do.	15 years, 1869–83.
Valencia, Aberdeen, Falmouth, Kew	Hourly mean values calculated and published in the vols. of "Hourly Means," for five days for calendar months and for the year for - - -	5 years, 1887–91.

I am, &c.
(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

Read—A letter from Mr. Baillie reporting that since last meeting five logs had been received, three of them being "excellent." Mr. Scott was instructed to convey the marked thanks of the Council to the observers.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

1. WARNINGS ISSUED.

A + B (successful) - - - -	=	7 districts.
C (failures) - - - -	=	4 districts.

2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch
April 18, 1894.

Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on the 3rd April - - -	1,454	18	1
Receipts from 4th to 17th April - - -	3,532	17	11
	4,987	16	0
Cheques drawn from 4th to 17th April - -	311	2	2
Balance on 17th April - - - -	£4,676	13	10

Submitted—The following list of publications which had been received since the last meeting :—

Chevalier, S.—Typhons de 1892, Juillet, Août, Septembre.

Ekholm, N.—Om psykrometerformeln, särskildt vid låga lufttryck.

Ekholm, N., und Arrhenius, S.—Ueber den Einfluss des Mondes auf den elektrischen Zustand der Erde.

Adelaide Observatory.—Meteorological observations made at the Adelaide Observatory, and other places in South Australia and the Northern Territory, during the years 1886–87.

Sheward, R.—Annual report of meteorological observations at Eastbourne for the year 1893.

Vienna, K. K. Sternwarte.—Meteorologische Beobachtungen auf der K. K. Sternwarte in den Jahren 1887 und 1888.

Peking, Inspectorate General of Customs.—List of the Chinese lighthouses, light-vessels, buoys, and beacons for 1894.

—— —— Medical reports for the year ended 31st March 1890.

Hamburg, Deutsche Seewarte.—Vierteljahrs-Wetter-Rundschau an der Hand der täglichen synoptischen Wetterkarten für den nordatlantischen Ocean, des Dänischen meteorologischen Instituts und der Deutschen Seewarte. Bd. v. 1887–88. Heft. 1-4.

Copenhagen und Hamburg, Dänisches Meteorologisches Institut und Deutsche Seewarte.—Tägliche synoptische Wetterkarten für den nordatlantischen Ozean und die anliegenden Theile der Kontinente. viii. Jahrg., 1–4 Quart., Dezember 1888 bis November 1889.

Bucharest, Institutul Meteorologic al Romaniei.—Analele. Tomul vii. 1891.

St. Petersburg, Kaiserliche Akademie der Wissenschaften.—Repertorium für Meteorologie. Bd. xvi.

Riccò, A.—Sulla relazione fra le perturbazioni magnetiche e le macchie solari.

Riccò, A. e Saija, G.—Osservazioni termometriche eseguite nel R. Osservatorio Etneo.

63, *Victoria Street, May* 3, 1894.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. GALTON. | MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (April 18) were read and confirmed.

Submitted an estimate (Letter 799) from Mr. Bond for erecting the second anemometer (Dines' pattern) on the roof for the sum of 8*l.* 4*s.* (Minutes, p. 6.)—Approved.

Read—A memorandum from Mr. Baillie stating that since last meeting four logs had been received, one being "excellent." Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council:—

1. WARNINGS ISSUED.

A + B (successful) - - - - -	= 11 districts.
C (failures) - - - - -	= 10 „

2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,
2nd May 1894.

Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 17th April - - - -	4,676	13	10
Receipts from 18th April to 1st May - -	9	9	11
	4,686	3	9
Cheques drawn from 18th April to 1st May - -	1,162	6	9
Balance on 1st May - - - -	3,523	17	0

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of April 1894 :—

The letters used have the following signification :—
a=complete success. | c=partial failure.
b=partial (*i.e.*, more than half) success. | d=total failure.

APRIL.

Districts.		Per-centages. Wind.	Weather.	Average Forecast.	Per-centage of Success. a + b.
Scotland, N.	a	47	50	49	82
,,	b	37	30	33	
,,	c	10	7	9	
,,	d	6	13	9	
Scotland, E.	a	44	43	44	70
,,	b	23	30	26	
,,	c	30	17	24	
,,	d	3	10	6	
England, N.E.	a	67	60	64	85
,,	b	23	20	21	
,,	c	10	20	15	
,,	d	0	0	0	
England, E.	a	47	57	52	89
,,	b	40	33	37	
,,	c	10	10	10	
,,	d	3	0	1	
Midland Counties	a	63	73	68	89
,,	b	17	24	21	
,,	c	17	3	10	
,,	d	3	0	1	
England, S.	a	54	70	62	87
,,	b	30	20	25	
,,	c	13	10	12	
,,	d	3	0	1	
Scotland, W.	a	47	53	50	75
,,	b	23	27	25	
,,	c	30	13	22	
,,	d	0	7	3	
England, N.W.	a	60	60	60	85
,,	b	30	20	25	
,,	c	10	17	14	
,,	d	0	3	1	
England, S.W.	a	50	70	60	84
,,	b	30	17	24	
,,	c	17	13	15	
,,	d	3	0	1	
Ireland, N.	a	40	60	50	79
,,	b	37	20	29	
,,	c	10	17	13	
,,	d	13	3	8	
Ireland, S.	a	40	47	44	75
,,	b	30	33	31	
,,	c	13	20	17	
,,	d	17	0	8	
Summary.					
British Isles	a	51	59	55	82
,,	b	29	25	27	
,,	c	15	13	14	
,,	d	5	3	4	

Read—The following letter :—

(M.O. 803.)

(No. 28,417.)

Board of Agriculture,
4, Whitehall Place, London, S.W.,
April 21, 1894.

SIR,

I AM directed by the Board of Agriculture to transmit, in response to the request contained in your letter to Major Craigie of the 14th instant, a memorandum on the subject of the experimental issue of Weather Forecasts in the course of last autumn. This will probably suffice for incorporation in the Annual Report of your Office.

I am, &c.
(Signed) RICHARD DAWSON,
Assistant Secretary.

Robert H. Scott, Esq., Secretary,
Meteorological Office.
63, Victoria Street, S.W.

WEATHER FORECASTS during HARVEST, 1893.

(M.O. 803.)

The Board of Agriculture, with a view to test the value of the weather forecasts issued by the Meteorological Council, and the disposition of agriculturists to make use of these warnings during harvest, arranged for an experimental transmission of the forecasts issued every afternoon during the months of August and September 1893. These were sent by telegraph to nearly two hundred selected telegraph offices in the rural districts of the counties of Essex and Northumberland.

The Post Office Authorities undertook to facilitate the despatch of these messages, the local postmasters being instructed to have them posted up in a conspicuous position in the window of the post office immediately on arrival. The time of receipt was about 4.30 p.m. daily, and such reports as have been received by the Board of Agriculture from the districts to which messages were sent dispose them to believe that considerable reference in arranging their next day's work was made to the forecasts thus exhibited by farmers resident within short distances of the several offices, and by others who, by means of messengers, were in communication with the towns and villages.

Specific observations made daily at Morpeth in Northumberland were very favourable as to the approximate accuracy of the forecasts, the direction of the wind being the item in which the warnings were occasionally in error. In the Allendale district of the same county a material saving of money by the economising of labour by pre-arrangements made on reliance in the forecasts was reported by one of the vice-presidents of the Newcastle Farmers Club.

The comparative steadiness of the weather conditions during the harvest months of last year, however, prevented a thorough test of the use of these weather warnings in furnishing reliable advice to agriculturists as to the meteorological conditions to be expected in the twenty-four hours covered by the forecasts, and the applicability of the system at different seasons and to more varied districts has yet to be determined.

With this view the Board of Agriculture have applied for the sanction of Her Majesty's Treasury to the repetition of the experiment in 1894 over a wider area and under weather conditions likely to be less uniform, selecting three eastern and three western counties and varying the period for supplying the forecasts so as to cover the time of hay harvest in some cases and that of grain harvest in others.

The Secretary was instructed to insert the letter in the Annual Report.

Submitted—Letter 705, containing the programme of the proposed meeting of the International Meteorological Committee at Upsala, August 20. (Minutes, 1893, p. 82.)

Submitted—The following reports of work during the month of April 1894 :—

MARINE BRANCH.

May 1, 1894

Examined 7 new logs.

For the district between the Cape of Good Hope and New Zealand, charting the wind-roses for March, August, and November, and drawing generalised current results for February and August. Also tabulating the monthly records of fog in the district.

Preparing the data contained in Office logs for the area between longitudes 20° E. and 90° W. south of the Equator, and extracting into data-books the observations in the Atlantic from the Equator to latitude 10° S.

Monthly means of air temperature at various coast stations have been added to the Red Sea wind charts.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.
(To 30th April 1894.)

Weekly Weather Reports, 1894.—All numbers issued promptly to date.
Quarterly Summary.—January to March.—Issued.
Monthly Summaries.—February issued; *March* in revise; April well in hand.
Daily Weather Report, 1894.—All numbers issued to date.
Checking of Daily (8.30 *p.m.*) *Forecasts.*—Done to date.
Primary Checking of Storm Warnings issued, 1894.—Done to date.
Final Checking of Storm Warnings issued, 1893.—Done to end of October.
Rainfall Publication.—Values for 100 stations (in all) have been sent to printer; those for 47 stations (in print) have been carefully revised; those for 24 more are "in proof," and the remainder are still at printer's—proof expected in a day or two.

(Signed) FREDC. GASTER.

Telegraphic Branch,
May 2, 1894.

PANTAGRAPH ROOM.

May 1, 1894.

Hourly Means.—The tables of duration and frequency of sunshine for the seven Observatories for the 10 years 1881–90 are ready for press.

The correction required by the Fort William standard barometer having been received, the necessary alterations were made in the values already calculated, and the remaining tables completed. The volume of "Hourly Means" for 1891 is now in the printer's hands.

The tables of mean values for 1892 have been commenced.

Some time has been occupied in connexion with the sunshine records, and an article on Anemometry prepared for the new edition of "Instructions in the use of Meteorological Instruments."

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

May 1, 1894.

Examinations.

July, 1893—*March*, 1894.—Proceeded with.
Weekly examination (on receipt) of curves and documents from all observatories.

Reports.

January–March, 1894.—Copies of "Notes of Errors" to Valencia.
Stonyhurst, January–March, 1894.—Investigations *re* deficiencies in curves caused by a mechanical defect.

Miscellaneous.

Diurnal Range of Rainfall, 1871–90.—Examination and correction of the hourly values, &c., proceeded with.
Aberdeen and Falmouth Wet-bulb Scale and Zero-line Values.—Proceeded with.
General routine work.

(Signed) T. E. ALLEN.

Submitted—The following list of publications which had been received since the last meeting:—

Batavia, Magnetical and Meteorological Observatory.—Observations, vol. xv. 1892.
—— —— Rainfall in the East Indian Archipelago. 14th year, 1892.
Harding, C.—The great storm of November 16th–20th, 1893.
Trieste, Osservatorio Astronomico Meteorologico.—Rapporto annuale. 1891.
Sofia, Station Centrale Météorologique.—Bulletin annuaire. 1891–1893.
Bremen, Meteorologische Station I. Ordnung.—Ergebnisse der meteorologischen Beobachtungen. Jahrg. iv. 1893.
Stockholm, Kongl. Svenska Vetenskaps-Akademien.—Meteorologiska Iakttagelser i Sverige. Bd. xxxi. 1889.
Broounof, P.—Orages dans le bassin du Dniéper en 1893.

63, *Victoria Street, May* 16, 1894.

PRESENT:

MR. GALTON IN THE CHAIR.

MR. BUCHAN. | MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (May 3) were read and confirmed.

Read—Letter 896 from Dr. Becker, of Glasgow, requesting that the Council would pay the premium for insurance of the instruments (Minutes, 1893, p. 86), inasmuch as the arrangements made by Professor Grant (Minutes, 1885, p. 74) for annual grants of assistance from local authorities had apparently lapsed.

It was decided to await the result of Dr. Becker's proposed renewal of application to local authorities.

Read—A memorandum from Mr. Baillie stating that since last meeting seven logs had been received, two of them being "excellent." Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Reported—Since the last meeting of the Council there had been no warnings issued, nor any gales experienced on the coasts of the United Kingdom.

(Signed) FREDC. GASTER.

Telegraphic Branch,
16th May 1894.

Submitted—The following statement of accounts: –

	£	*s.*	*d.*
Cash balance on 1st May	3,523	17	0
Receipts from 2nd to 15th May	15	15	3
	3,539	12	3
Cheques drawn from 2nd to 15th May	149	14	11
Balance on 15th May	£3,389	17	4

Submitted—The following list of publications which had been received since the last meeting:—

Wild, H.—Magnetische Wirkung der Gestirne auf der Erde.

—— Ueber die Bestimmung der absoluten magnetischen Declination im Konstantinow'schen Observatorium zu Pawlowsk.

Vienna, Sonnblick-Verein.—Zweiter Jahresbericht des Sonnblick-Vereines für das Jahr 1893.

Gambia.—Comparative rainfall, Colony of the Gambia, 1889–1893, and meteorological observations, 1893.

Sohncke, L. und Finsterwalder, S.—Die erste wissenschaftliche Nachtfahrt des Münchener Vereins für Luftschiffahrt.

Less, E.—Die Vertheilung des Luftdruckes über Europa während der Trockenzeiten des Frühlings und Sommers, 1893.

Halle, Kaiserliche Leopoldino-Carolinische Deutsche Akademie der Naturforscher—Leopoldina. Heft xxix. 1893.

Hoppe, O.—Oberirdische und unterirdische Wirkungen eines Blitzstrahles.

63, *Victoria Street, May* 30, 1894.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

PROFESSOR DARWIN.	MR. STONE.
MR. GALTON.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (May 16) were read and confirmed.

Read—The following letter :—

(M.O. 981.)
(No. 28,938.)

Board of Agriculture,
4, Whitehall Place, London, S.W.,
May 21, 1894.

SIR,

I AM directed by the Board of Agriculture to acquaint you, for the information of the Meteorological Council, that the Lords Commissioners of Her Majesty's Treasury have sanctioned a repetition, on a more extended scale than 1893, of the experiment of transmitting daily by telegraph the afternoon weather forecasts to the telegraph offices in certain selected agricultural districts during the period both of hay and corn harvest.

The counties selected for the experiment this season are Somerset, Carnarvon, Ayr, Cambridge, East Riding of Yorkshire, and Haddington, of which the first three may be regarded as representative areas for the growth of hay, while the last three are more typical corn counties. It is intended to commence the issue of forecasts to these counties at different dates according to the probable dates of hay and corn harvest, and to continue the sending of the telegrams for eight weeks in each case from the commencement thus made.

The Board would, therefore, be glad if your Council could make the necessary arrangements to communicate as last year, daily to the General Post Office, from and after a date to be subsequently specified for each county, the afternoon forecasts relating to the particular district in which the counties above named are situate.

I am, &c.
(Signed) T. H. ELLIOTT,
Secretary.

R. H. Scott, Esq., F.R.S.,
Secretary, Meteorological Council,
63, Victoria Street, S.W.

Mr. Scott reported that on the 21st instant he had had an interview with Major Craigie at the Agricultural Department. He was instructed to reply that the Council would be ready to forward the forecasts, as in 1893, on receipt of information as to the date of commencement (P.C. 1029).

Reported that the arrangements for the usual Hay Harvest forecasts were in progress.

Read—The following letter (Minutes, 1893, p. 78) :—

(M.O. 988.)

Office of the Engineer-in-Chief,
General Post Office, London,
May 22, 1894.

DEAR SIR,

WITH reference to your letter M.O. 233 of the 8th February, I much regret that owing to various circumstances the cleaning, &c. of the electrical anemometer has taken much longer than was anticipated; the apparatus is, however, now quite complete and ready for inspection by Mr. Chree or any of his assistants on any convenient day you may name.

Yours, &c.
(Signed) W. H. PREECE.

R. H. Scott, Esq.,
Meteorological Office,
63, Victoria Street, S.W.

Mr. Scott was instructed to request Mr. Chree to make an appointment to go and inspect the instrument (P.C. 1038) with Mr. R. Curtis.

Read—A letter from Mr. Chree (No. 1,039), reporting that the cloud camera stand in the Old Deer Park had been knocked down, and that he had ordered its repair.

Mr. Scott was instructed to request him to forward the account for payment to the Office in usual course. (P.C. 1046.)

Submitted an *ad interim* report from Mr. R. Curtis on the action of the two Dines' anemometers at present on the roof of the Office. (M.O. 1047.)

E 81252.

Submitted the charts of the Red Sea data (Minutes, 1886, p. 112). It was resolved to have the mean values for the wet bulb thermometer inserted numerically beside the curves of air temperature.

Read—A memorandum from Mr. Baillie, stating that since last meeting eight logs had been received, four of them being "excellent." Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Reported—That since the last meeting of the Council there had been no warnings issued to, nor had any gales been experienced on the coasts of the British Islands.

Telegraphic Branch,
May 30, 1894.

(Signed) FRED. GASTER.

Submitted—The following—

RETURN of the RESULT of the COMPARISON between the WARNINGS ISSUED and the WEATHER EXPERIENCED in 1893.

COASTS.	Total Number of Orders to Hoist and Repetitions.	Warnings justified by subsequent Gales. Force 8 and upwards.	Warnings justified by subsequent strong Winds. Forces 6 and 7.	Warnings not justified by subsequent Weather.	Warnings late. Force 9 reached at two Stations before issue.	Warnings partially late. Force 9 reached at one Station before issue.	Warnings issued unnecessarily owing to Telegraphic Errors.	STORMS FOR WHICH NO WARNING WAS ISSUED.
SCOTLAND, N.E.	43	33	6	2	—	2	—	Feb. 14, Mar. 15, Sept. 21.
Do. E.	29	12	12	5	—	—	—	Aug. 21.
Do. N.W.	42	27	10	2	1	2	—	Mar. 15, Oct. 25, Dec. 8.
Do. W.	38	21	14	3	—	—	—	
IRELAND, S.W.	41	22	12	5	1	1	—	Aug. 21, Oct. 25.
Do. N.W.	43	26	13	2	1	1	—	Mar. 15, Oct. 25, Dec. 20–21.
IRISH SEA	37	36	1	—	—	—	—	Feb. 26, Mar. 15, Aug. 21, Oct. 25, Dec. 20–21.
ST. GEORGE'S CHANNEL	32	14	12	4	—	1	1	
BRISTOL CHANNEL	35	22	10	1	—	1	1	Dec. 20–21.
ENGLAND, S.W.	35	22	8	4	—	—	1	Dec. 20–21.
Do. S.	28	17	10	—	—	1	—	Feb. 26.
Do. S.E.	29	13	14	2	—	—	—	Feb. 26.
Do. E.	25	14	8	3	—	—	—	
Do. N.E.	23	13	7	1	—	2	—	Oct. 25, Dec. 15–16.
TOTALS	480	292	137	34	3	11	3	
PER-CENTAGES	—	60·8	28·6	7·1	0·6	2·3	0·6	

GALES EXPERIENCED but for which no WARNING was issued.

February 14th.—A strong South-Easterly gale over the N.E. of Scotland. Our W. and N.W. coasts had been warned, but on the night of February 13th–14th a new depression—both larger and deeper than the one which preceded it—advanced more rapidly than was anticipated, and unexpectedly caused South-Easterly gales in Scotland. On the morning of the 14th it was too late to remedy the defect.

February 26th.—A Southerly gale over the S. and E. of England, and a North-Westerly gale in the Irish Sea.

Force 8 was *exceeded* at a few stations only; the wind blowing as a gale in zones, or bands. The appearance of the map for 6 p.m. on 25th was not all threatening—the wind was, in fact, then decreasing in force.

March 15th.—A Westerly gale over Scotland, the N.W. of Ireland, and the Irish Sea.

The 6 p.m. chart of March 14th showed a depression advancing towards Norway from the Westward, not at all of a bad appearance, but its intensity increased later. At 8 a.m. on 15th it was altogether too late to do anything.

August 21st.—A South-Westerly gale in Ireland and some parts of Scotland. There was evidently a depression approaching Ireland at 6 p.m. on 20th, but the Irish reports were so faulty that I could make nothing of them. The actual changes were also very complex.

September 25th.—A Westerly gale over the Irish Sea and N.E. of England. A large, but not deep depression lay over the northern parts of our area on the 24th, and was moving eastwards.

A "V" subsequently appeared in the west. It is remarkable that the observations we received by wire showed no general gale nor anything of a really stormy character in the conditions.

December 8th, Scotland N.W.—A South-Westerly gale.

There was no indication in the map for 6 p.m., 7th, that the depression which caused this gale (over one district only) was approaching.

December 20th–21st.—A South-Westerly gale over the N. of Ireland, Irish Sea, and Bristol Channel.

This was caused by a deep secondary depression, of which the reports for the 19th gave no indication whatever.

On September 21st and December 15th to 16th.—Gales were felt on our N.E. coasts. In these cases warnings had been duly sent to adjacent coasts, but the gale spread further than was anticipated.

Read—Letter 960 from the Royal Meteorological Society, applying for a grant of 25*l.* towards their inspection expenses (Minutes, 1893, p. 25).—Sanctioned (P.C. 1039.)

Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 15th May - - - -	3,389	17	4
Receipts, 16th to 29th May - - - -	51	2	8
	3,441	0	0
Cheques drawn from 16th to 29th May - -	76	9	10
Balance on 29th May - - - - -	3,364	10	2

Submitted—The following list of publications which had been received since the last meeting:—

Hamburg, Deutsche Seewarte.—Indischer Ozean. Ein Atlas von 35 Karten, die physikalischen Verhältnisse und die Verkehrs-Strassen darstellend.

Kew Observatory.—Report of the Incorporated Kew Committee for the year ending December 31, 1893.

London, Board of Agriculture.—Agricultural produce statistics of Great Britain, showing the estimated total produce, and average yield per acre, of the principal crops, with abstract returns for the United Kingdom, 1893.

Wellington, Meteorological Office.—Return of annual rainfall in the colony from 1864 to 1892.

London, Army Medical Department.—Report for the year 1892.

Makaroff, S.—Le "Vitiaz" et l'Océan Pacifique. Observations hydrologiques faites par les Officiers de la corvette "Vitiaz" pendant un voyage autour du monde, exécuté de 1886 à 1889, et recueil des observations sur la température et le poids specifique de l'eau de l'Océan Pacifique Nord.

London, General Register Office.—Annual report of the Registrar-General of births, deaths, and marriages in England. 1892.

Durand-Gréville, E.—Les grains et les orages. (2 papers.)

Bucharest, Institut Météorologique.—2me resumé des observations météorologiques de Bucarest (Filaret) pour les années 1891 et 1892 et pour la période de 1885 à 1890.

63, *Victoria Street, June* 13, 1894.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.	MR. GALTON.
PROFESSOR DARWIN.	MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (May 30) were read and confirmed.

Read—A letter from Mr. Wragge (M.O. 1080) in reply to a request from the office (P.C. 515/94) for copies of observations from Pacific Islands existing in the office at Brisbane. Mr. Wragge offers to supply the data on repayment of the cost of copying, and suggests that his office should undertake the discussion of the Meteorology of the South Pacific.

Mr. Scott was instructed to reply that the Council felt themselves unable to recognise any such distribution of marine meteorological work as Mr. Wragge suggested, but were quite ready to defray the cost of copying data supplied to them (P.C. 1111).

Read—Letter 1128 from Mr. Montefiore, secretary to the Jackson-Harmsworth Arctic expedition, requesting to be supplied with tracings of the currents for the Polar regions which are on the Current Charts at present in preparation.—Sanctioned (P.C. 1117).

Reported—That the issue of Hay Harvest forecasts to the Board of Agriculture, for the county of Somerset had been commenced on the 11th instant (Minutes, p. 17).

Read—The following reports (Minutes, p. 17):—

(M.O. 1113)

Kew Observatory, Richmond, Surrey,
June 8, 1894.

DEAR MR. SCOTT,

I VISITED the General Post Office yesterday and was shown the electrical anemometer by Mr. Kempe. It was obvious that a great deal has been done to remedy the defects that presented themselves previously. This is more especially the case with the arrangements for recording the direction of the wind, which proved unsatisfactory when the instrument was at Kew before. There is also a new arrangement for preventing sparking during the making and breaking of contact which seemed satisfactorily to meet the case. The burning of the contact pieces is a fruitful cause of trouble, leading to bad contacts, so that this seems likely to reduce the chance of a breakdown. The internal parts of the instrument seemed in good working order and ready for a fair trial at Kew.

I understood from Mr. Kempe that if the Meteorological Council decided to try the instrument here it would be necessary, in accordance with the postal regulations, that we should undertake the cartage of the instrument. If the Council send me the necessary authorisation I shall be happy to make the necessary arrangements with Mr. Kempe. It will be unnecessary to consult the Kew Committee now, their permission having been obtained last January.

I am, &c.
(Signed) CHARLES CHREE.

Robert H. Scott, Esq., F.R.S.,
Secretary Meteorological Council.

ELECTRICAL ANEMOMETER.

SIR,

June 9, 1894

I HAVE to report that in accordance with your instructions I went on the 7th instant to the General Post Office and again saw the electrical anemometer.

Since my last visit the recording portion had been dismounted and thoroughly overhauled and cleaned, and it appears to be now in proper order and quite ready for erection at Kew. Mr. Kempe told me that during the entire time it had been running, with the improved contact arrangements, there had never been the slightest failure in its action, and he expressed himself as being more than satisfied with its working.

I also examined the out-of-door portion of the instrument on the roof. The only alteration here was the substitution of a fan-brake for the one formerly in use to prevent oscillation of the wheel

by which the contacts are made when the wind shifts in direction. Otherwise the instrument was unchanged from its original form. No difficulty, however was ever experienced with this portion of the instrument.

The arrow-head was off the vane, but Mr. Kempe said it should be refixed before the instrument was sent away.

I am, &c.

R. H. Scott, Esq., F.R.S. (Signed) R. H. CURTIS.

Mr. Scott was instructed to arrange for the re-erection of the anemometer at Kew.

Read—Letter 1136 from Mr. R. H. Curtis requesting permission to use unpublished records from the bridled anemometer in a paper for the Royal Meteorological Society —Granted.

Mr. Scott reported that the instruments at most of the Observatories had now been insured (Minutes, 1893, p. 86). He was instructed to authorise payment of the premium in each case, and to request that the policy should be deposited at the Meteorological Office (P.C. 1121, &c.)

Reported—That since last meeting three logs had been received, two of them being "excellent," Mr. Scott was instructed to convey the best thanks to the observers.

Read—The following report :—

STORM WARNING CHECKING.

Since the last meeting of the Council there have been no warnings issued to our coasts, nor have any storms been reported.

Telegraphic Branch, (Signed) FREDC. GASTER.
June 13, 1894.

Submitted—The following statement of weekly payments, as now authorised, to Telegraphic Reporters for Meteorological Observations, made directly or through the Post Office, including allowances for Sunday attendance at extra-official hours, &c. :—

AMOUNTS PAID DIRECTLY BY METEOROLOGICAL OFFICE.

	s.	d.		s.	d.		£	s.	d.
Aberdeen	7	6	Cambridge	7	0	Christiania (M.O.) (two stations).	5	10	0
Dungeness	7	0	Dungeness (Telegraphist)	2	0		per quarter.		
Hawes Junction	3	0	Holyhead	6	0	Dunrossness	0	6	0
Jersey	6	0	Lloyds { Malin Head / N. Foreland }	13	6	Hurst Castle	0	6	0
Loughborough	5	6	Nairn	6	6	London	0	6	0
Parsonstown	5	0	Prawle Point	5	0	Oxford	0	5	6
Scilly	10	0	Spurn Head	5	0	St. Ann's Head	0	5	0
Wick	5	0	Yarmouth	6	0	Stornoway	0	8	6
						York	0	6	0

AMOUNTS PAID THROUGH POST OFFICE ACCOUNT.

	s.	d.		s.	d.		s.	d.
Aberdeen, P.O.	2	0	Ardrossan	5	0	Ardrossan, P.O.	1	6
Ballina, P.O.	2	0	Belmullet	6	0	Belmullet, P.O.	2	0
Cahirciveen, P.O.	1	0	Donaghadee	6	0	Donaghadee, P.O.	2	0
Dungeness	1	0	Dunrossness, P.O.	2	0	Killarney, P.O.	1	6
Leith	6	6	Leith, P.O.	1	0	Lerwick, P.O.	2	0
Limerick, P.O.	1	0	London Central Tel. Office (compilation charges)	5	0	Malin, P.O.	2	0
Nairn, P.O.	1	0	North Shields	6	6	Parsonstown, P.O.	0	6
Roche's Point	6	0	Roche's Point, P.O.	1	0	St. Ann's Head, P.O.	2	0
St. Aubin's, P.O.	1	0	Scilly, P.O.	1	0	Stornoway, P.O.	2	0
Wick, P.O.	1	0						

In addition to the above, varying amounts for postage and other occasional incidental charges, are allowed, and in the case of those observers whose reports have been trustworthy during the year an annual bonus of 3*l.* 3*s.* 0*d.* is paid.

—Approved.

Submitted—The following reports of work during the month of May 1894 :—

MARINE BRANCH.

June 12, 1894.

Examined 16 new logs and one lighthouse register.

Preparing the final wind and current charts, including isobars and air and sea isotherms; discussion of the fog observations; and obtaining the monthly range of sea temperature for the district between the Cape of Good Hope and New Zealand.

Preparation and extraction of the data for the area south of Equator between the longitudes o 10° E. and 90° W.

The Red Sea Current Chart for the month of December passed for press; adding the mean wet bulb values to the monthly air temperature curves on the Wind Charts.

Charting Ocean Currents contained in recently received Office logs.

(Signed) CHAS. HARDING.

The Marine Superintendent.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.
To 31st May 1894.

Weekly Weather Report, 1894:—

All numbers issued promptly, to date.

Monthly Summaries.—To end of April—issued; May—well in hand; Appendices—well in hand.

Daily Weather Report:—

All numbers issued promptly, to date.

Checking of Daily (8.30 *p.m.*) *Forecasts.*—Done to date.

Primary checking of Storm Warnings Issued, 1894.—Done to date.

Final checking of Storm Warnings Issued, 1893.—Completed. Summary and notes handed in.

Rainfall Publication:—

Stations for which printer has had "copy" - - - - 104
Do. do. proof has been received - - 95

Of these all have been once revised, half of them twice, and the third and fourth half-sheets are now in course of re-arrangement, so as to allow of introduction of the "London and district" area.

The Whitsuntide and Queen's Birthday holidays and some others have been taken during this month.

Arrangements are in progress for Hay Harvest forecasts.

(Signed) FREDC. GASTER.

Telegraphic Branch,
June 13, 1894.

PANTAGRAPH ROOM.

June 1, 1894.

Hourly Means.

The preparation of the tables of mean values for the year 1892 is being proceeded with.

Miscellaneous.

An article on sunshine recorders prepared for the new edition of "Instructions in the use of Meteorological Instruments."

A great deal of time occupied in connexion with Dines' pressure-tube anemometer, and in the erection of a second instrument.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

June 1, 1894.

Examinations.

July 1893.—Completed.

August 1893–*April* 1894.—Proceeded with.

Weekly examination (on receipt) of Curves and Documents from all Observatories.

Miscellaneous.

Diurnal Range of Rainfall, 1881–90.—Completed.

Determination of the Aberdeen Wet Bulb Scale and Zero Line Value.—Completed.

Determination of the Falmouth Dry and Wet Bulb Scales and Zero Line Values.—Completed.

Determination of the Kew Barograph Scale Value.—Completed.

General routine work.

(Signed) T. E. ALLEN.

Submitted—The following statement of accounts:—

	£	*s.*	*d.*
Cash balance on 29th May - - -	3,364	10	2
Receipts from 30th May to 12th June -	20	13	1
	3,385	3	3
Cheques drawn from 30th May to 12th June -	764	11	11
Balance on 12th June - - -	2,620	11	4

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of May 1894 :—

The letters used have the following signification :—

a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

MAY.

Districts.		Per-centages. Wind.	Weather.	Average Forecast.	Per-centage of Success a + b.
Scotland, N.	a	58	65	62	83
"	b	23	19	21	
"	c	13	13	13	
"	d	6	3	4	
Scotland, E.	a	49	74	62	88
"	b	39	13	26	
"	c	6	10	8	
"	d	6	3	4	
England, N.E.	a	68	68	68	88
"	b	13	26	20	
"	c	13	0	6	
"	d	6	6	6	
England, E.	a	52	68	60	86
"	b	32	19	26	
"	c	16	3	9	
"	d	0	10	5	
Midland Counties	a	65	74	70	84
"	b	16	13	14	
"	c	16	7	12	
"	d	3	6	4	
England, S.	a	52	68	60	87
"	b	35	19	27	
"	c	13	10	12	
"	d	0	3	1	
Scotland, W.	a	39	52	46	68
"	b	23	22	22	
"	c	22	13	18	
"	d	16	13	14	
England, N.W.	a	45	78	62	80
"	b	26	10	18	
"	c	16	6	11	
"	d	13	6	9	
England, S.W.	a	71	58	65	89
"	b	16	32	24	
"	c	0	10	5	
"	d	13	0	6	
Ireland, N.	a	39	74	57	76
"	b	29	10	19	
"	c	13	6	10	
"	d	19	10	14	
Ireland, S.	a	48	68	58	81
"	b	26	20	23	
"	c	16	6	11	
"	d	10	6	8	
Summary.					
British Isles	a	53	68	61	82
"	b	25	18	21	
"	c	13	8	11	
"	d	9	6	7	

Submitted—The following list of publications which had been received since the last meeting :—

Hann, J.—Resultate der meteorologischen Beobachtungen auf der Insel Cypern 1887 bis 1891.

London, British Association for the advancement of Science.—Report of the Sixty-third Meeting held at Nottingham in September 1893.

Toronto, Meteorological Service.—Report 1889.

Langley, S. P.—The internal work of the wind.

Falmouth Observatory.—Meteorological and magnetical tables and reports for the year 1893, with notes by W. L. Fox.

Greenwich, Royal Observatory.—Report of the Astronomer Royal to the Board of Visitors, 1894.

British New Guinea.—Annual report on British New Guinea from 1st July 1891 to 30th June 1892.

Tebbutt, J.—Report of Mr. Tebbutt's Observatory, the Peninsula, Windsor, New South Wales for the year 1893.

Berlin,Königlich Preussisches Meteorologisches Institut.—Ergebnisse der Niederschlags-Beobachtungen im Jahre 1892.

Denza, F.—I grandi calori d'Agosto nel 1893.

—— Aurore boreali viste nel 1893.

—— I freddi del Gennaio 1893.

—— La siccità nella primavera del 1893.

Washington Weather Bureau.—Report of the chief of the weather bureau, 1891–92.

Wollny, E.—Forstlich-meteorologische Beobachtungen. (Dritte Mittheilung.)

Koudritzki, M.—Données nouvelles pour la question de l'influence des forêts sur le climat. (In Russian.)

The next meeting of Council was fixed for July 11.

63, *Victoria Street, July* 11, 1894.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.	MR. GALTON.
PROFESSOR DARWIN.	MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (June 13) were read and confirmed.

The Secretary—Reported that the Report of the Council for the year 1893–4 had been forwarded to the Royal Society on the 28th ultimo (P.C. 1238).

Read—Letter 1216 from Rear Admiral Makaroff, of the Russian Navy, enclosing copies of a Memorandum on the subject of Marine Meteorology, accompanied by the subjoined circular.

" The Council of the Imperial Russian Geographical Society, taking interest in the proposal (copy enclosed) of Rear Admiral S. Makaroff, Fellow I.R.G.S., concerning the necessity of an international agreement about the publication of materials contained in the ships meteorological journals, asks you, as scientist interested in progress of Meteorology, to favour them with an exposition of your views thereabout."

Resolved—That Admiral Makaroff be informed that though the Council recognise that the interchange of information as to Oceanic Meteorology is most desirable, they do not see their way to the adoption of any international system for the discussion of observations such as he has suggested (P.C. 1333).

Read—Letter 1237 from Mr. Chree, with a proposal for a resumption of a discussion of the Kew Electrograms (Minutes, 1891, p. 20). Mr. Scott was instructed to confer with Mr. Chree and to submit a report on the subject in October (P.C. 1329).

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of June 1894 :—

The letters used have the following signification :—
a=complete success. | **c**=partial failure.
b=partial (*i.e.*, more than half) success. | **d**=total failure.

JUNE.

Districts.		Per-centages. Wind.	Weather.	Average Forecast.	Per-centage of Success. a + b.
Scotland, N.	a	60	60	60	84
,,	b	20	27	24	
,,	c	7	7	7	
,,	d	13	6	9	
Scotland, E.	a	47	63	55	82
,,	b	30	23	27	
,,	c	13	7	10	
,,	d	10	7	8	
England, N.E.	a	74	70	72	87
,,	b	10	20	15	
,,	c	13	0	7	
,,	d	3	10	6	
England, E.	a	64	60	62	84
,,	b	23	20	22	
,,	c	13	10	11	
,,	d	0	10	5	
Midland Counties	a	60	57	59	85
,,	b	30	23	26	
,,	c	10	17	14	
,,	d	0	3	1	
England, S.	a	63	53	58	80
,,	b	27	17	22	
,,	c	7	17	12	
,,	d	3	13	8	
Scotland, W.	a	37	60	49	76
,,	b	37	17	27	
,,	c	16	13	14	
,,	d	10	10	10	
England, N.W.	a	33	77	55	80
,,	b	40	10	25	
,,	c	17	10	14	
,,	d	10	3	6	
England, S.W.	a	47	54	51	86
,,	b	37	33	35	
,,	c	10	7	8	
,,	d	6	6	6	
Ireland, N.	a	47	63	55	72
,,	b	17	17	17	
,,	c	26	13	20	
,,	d	10	7	8	
Ireland, S.	a	40	53	47	69
,,	b	27	17	22	
,,	c	26	23	24	
,,	d	7	7	7	
Summary.					
British Isles	a	52	61	57	80
,,	b	27	20	23	
,,	c	14	12	13	
,,	d	7	7	7	

Submitted—The following statement of accounts for the quarter ending 30th June 1894:—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1893–94	- - -	1,517 12 11	Administration:		
Proportion of vote -	- - -	3,500 0 0	Secretary - -	200 0 0	
Repayment of expenses charged under—			Salaries and wages -	220 6 6	
(1.) Incidental expenses	0 3 0		Rent, fuel, and lighting	195 7 1	
(2.) Observatories -	9 11		Furniture and fittings	3 1 6	
		9 14 8	Incidental and contingent expenses -	46 13 6	
			Pensions - -	46 14 1	
					712 2 8
Supply of Weather Information:			Special Researches:		
			Salaries and other charges - -	- - -	259 1 8
D.W. Charts and Forecasts - -	72 14 7				
6 p.m. Charts - -	6 5 0		Land Meteorology:		
Information for Press Agencies, &c.	21 2 4		Observatories and stations - -	577 11 10	
Telegrams - -	46 4 3		Discussion and reduction of observations -	399 8 0	
		146 6 2			976 19 10
Sale of Instruments, &c.:			Weather Information and Forecasts:		
			Telegraphic reports and storm warnings	803 14 8	
M.O. account - -	10 7 5		Preparation and issue of reports and forecasts - -	462 3 2	
Royal Navy account -	0 7 0				
Mercantile Marine account - -	0 1				1,265 17 10
		11 6 5	Inspections:		
			Salaries and travelling	- - -	27 3 0
Commission charged on work done for Colonies, &c. - -	- - -	1 1 6	Ocean Meteorology:		
			Discussion and reduction of observations -	401 4 0	
			Expenses incidental to the supply of instruments:		
			Proportion for care and issue of instruments -	50 0 0	
			Royal Navy -	295 16 11	
			Mercantile Marine	60 12 11	
			Distant island and coast stations	2 10 0	
					810 3 10
			Miscellaneous Commissions - -	- - -	29 11 0
			Balance:		
			Cash at Bank -	1,028 13 11	
			„ at Office -	76 7 11	
					1,105 1 10
		£5,186 1 8			£5,186 1 8

Liabilities.	£ s. d.	Assets.	£ s. d.
To Council - - - -	250 0 0	By H.M. Exchequer - - -	325 0 0
„ Post Office (estimated) - -	125 0 0	„ cash at Bank - - -	1,028 13 11
„ sundry creditors - - -	*658 14 2	„ „ at Office - - -	76 7 11
„ balance - - -	529 17 10	„ sundry debtors - - -	133 10 2
	£1,563 12 0		£1,563 12 0

* Exclusive of new instruments ordered, but not delivered on 30th June, 90*l*.

Reported—That the cash accounts for the six months ended the 31st March 1894, had been audited on the 14th June by the Chairman and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts for the six months amounted to 8,720*l.* 3*s.* 9*d.*, the payments amounted to 9,035*l.* 3*s.* 9*d.*, leaving a balance of 1,517*l.* 12*s.* 11*d.* in hand and at the bank on the 1st April 1894, as against 1,500*l.* 8*s.* 2*d.* on the 1st April 1893.

Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on the 12th June - - -	2,620	11	4
Receipts from 13th June to 10th July - -	3,551	3	11
	6,171	15	3
Cheques drawn from 13th June to 10th July -	1,643	19	2
Balance on 10th July - - - -	£4,527	16	1

Read—A letter from Mr. Chree (M.O. 1330) reporting that the Electrical Anemometer (Minutes, p. 21) had arrived at Kew, and asking for authority to put the battery requisite for working it in repair. Sanctioned (P.C. 1344.)

Reported—That on application from the Secretary of the Jackson-Harmsworth Arctic expedition (M.O. 1175 and 1244), a supply of instruments had been issued to that expedition, (P.C. 1242.)

Read—Letter 1238 from the Royal Geographical Society enclosing a request for instruments from a Mr. Leaky of the C.M.S. Station at Buganda.

Mr. Scott was instructed to forward the correspondence to the Church Missionary Society, and inquire if that body was prepared to undertake responsibility for safe carriage of instruments and for subsequent maintenance of observations (P.C. 1326).

Read—Letter 1340 from Mrs. Ley stating that the health of Mr. Clement Ley was not such that he could undertake inspections this year. Mr. Scott was instructed to make arrangements for carrying out the necessary English inspections by the clerks of the Office.

Read—A memorandum from Mr. Baillie, stating that since last meeting 10 logs had been received, 7 of them being "Excellent." Mr. Scott was instructed to present charts (O 92) to Captain Seaton, S.S. "Thames," and O 90 to Captain Walton, S.S. "Port Victor," and to convey the best thanks of the Council to the other observers.

Submitted—A memorandum (M.O. 1341) from Mr. R. Curtis as to the substitution of a pen for a pencil with the bridled anemometer, and as to the regulation of the zero of the scale.

Mr. Scott was instructed to carry out the suggestions if found feasible.

Read—The following report:—

CHECKING OF STORM WARNINGS, 1894.

Since the last meeting of the Meteorological Council there have been no warnings issued to our coasts, nor have any gales been experienced.

(Signed) FREDC. GASTER.

Telegraphic Branch,
11th July 1894.

Submitted—The following reports of work during the month of June 1894:—

MARINE BRANCH.

July 11, 1894.

Examined 10 new logs.

Tabulating and obtaining the per-centages of fog observations, and preparing monthly charts showing the various elements discussed in the district between the Cape of Good Hope and New Zealand.

Advancing the preparation of the data contained in the Office logs for the district between the West Coast of Africa and longitude 90° W., south of the Equator.

Making additions to the Red Sea Monthly Wind Charts before sending them to press.

Charting Ocean Currents contained in Office logs of recent date.

Examined proofs of plates of Isobars for January and July for the new issue of "The Barometer Manual for the use of Seamen."

Tracings made of the Monthly Current Charts of the Arctic regions for the use of the Jackson-Harmsworth Polar expedition.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.
(To 30th June 1894.)

Weekly Weather Report 1894.—All numbers issued to date.
Monthly Summaries.—All issued as far as that for May. All other parts well in hand.
Daily Weather Report.—All numbers issued promptly.
Checking of Daily Forecasts, 1894.—Done to date.
Primary Checking of Storm Warnings issued, 1894.—Done to date.
Rainfall Publication :—

Total number of stations for which printer has had "copy" - -	157
No. of stations for which proof has been received - - -	144

These have now been carefully revised, and progress is being made with the list of observers and general index to the returns.

Chart for Annual Report, 1893–4, showing all stations from which meteorological information is now received by this Office.—About two-thirds done.

Some of the clerks are beginning to take their annual leave.

(Signed) FREDC. GASTER.

Telegraphic Branch,
July 11, 1894.

PANTAGRAPH ROOM.

July 1, 1894.

Hourly Means.—The calculation of the various mean values required for the volume for 1892 is being proceeded with. The revise of the sheets for the year 1891 is being carried on as quickly as they can be obtained from the printer.

Miscellaneous.—The usual routine work of the room has been kept up to date. A note has been prepared for the Annual Report on the working of the Dines' pressure-tube anemometer during the year 1893-4.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

July 2, 1894.

Examinations.

August 1893.—Completed.
September 1893-*June* 1894.—Proceeded with.
Weekly examination (on receipt) of curves and documents from all observatories.

Reports.

July 1893.—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.

Miscellaneous.

Preparing and copying notes for the annual inspections of observatories.
General routine work.

(Signed) T. E. ALLEN.

Submitted—The following list of publications which had been received since the last meeting :—

London, Board of Trade.—Abstracts of the returns made to the Board of Trade of shipping casualties from the 1st July 1892 to the 30th June 1893.

Trinidad, Royal Botanic Gardens.—Report of the Superintendent for the year 1893

Christiania, Norwegisches Meteorologisches Institut.—Jahrbuch für 1892.

London, Royal Society.—Catalogue of scientific papers. 1874–1883. Vol. x.

London, Admiralty, Hydrographic Office.—Sailing directions for the south-east coast of Nova Scotia and Bay of Fundy. Fourth edition.

—— —— Norway Pilot. Part ii. From the Naze to the North Cape, thence to Jacob River. Second edition.

—— —— The China Sea Directory. Vol. iv. Third edition.

London, General Register Office.—Annual summary of births, deaths, and causes of deaths in London and other great towns. 1893.

Utrecht, Koninklijk Nederlandsch Meteorologisch Instituut.—De stroomen op de Nederlandsche Kust. 2de Vermeerderde druk.

Paris, Bureau Central Météorologique de France.—Annales. 1892. i.–iii.
Falmouth, Royal Cornwall Polytechnic Society.—Annual report. 1893.
Volante, G.—Osservazioni meteorologiche fatte in Alessandria alla Specola del Seminario nell' anno 1893. Anno xxxvi.
Sundell, A. F.—En akustisk anemometer.
—— Åskvädren i Finland. 1893.
—— Snötäckets höjd i Finland vintern. 1891–92.
Calcutta, Meteorological Office.—Meteorological observations recorded at seven stations in India in the year 1893, corrected and reduced.
Very, F. W.—Hail-storms.
Washington, Department of Agriculture, Weather Bureau.—Bulletin No. 11. Report of the International Meteorological Congress, held at Chicago, Ill., August 21–24, 1893. Part i.
—— —— —— Bulletin B. Currents of the great lakes, as deduced from the movements of bottle papers during the seasons of 1892 and 1893.
Baltimore, Maryland State Weather Service.—The climatology and physical features of Maryland. First biennial report of the Maryland State Weather Service for the years 1892 and 1893.
Rung, G.—Répartition de la pression atmosphérique sur l'Océan Atlantique septentrional d'après les observations de 1870 à 1889, avec la direction moyenne du vent sur les littoraux.
Fergusson, S. P.—The pole star recorder.
Hann, J.—Ebbe und Fluth im Luftmeer der Erde.
Berlin, Königlich Preussisches Meteorologisches Institut.—Bericht über die Thätigkeit . . . im Jahre 1893.
Aitken, John.—On the number of dust particles in the atmosphere of certain places in Great Britain and on the Continent, with remarks on the relation between the amount of dust and meteorological phenomena. Part iii.
Bucharest, Institut Météorologique.—Septième rapport sur les travaux de l'Institut Météorologique au cours de l'année 1893.
Helsingfors, Institut Météorologique Central.—Observations faites à Helsingfors. Vols. vi.–viii. and xi. 1887–1889 and 1892.
—— —— Observations météorologiques. 1881–1888.

63, *Victoria Street, October* 17, 1894.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.	MR. GALTON.
PROFESSOR DARWIN.	MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (July 11) were read and confirmed.

Mr. Scott reported that the new lease of the Office for five years had been signed by him on the 21st July, in accordance with instructions from the Chairman. (Letter 1211.) (Minutes, 1893, p. 86.)

Mr. Scott reported that he had attended the meeting of the International Meteorological Committee at Upsala, August 20th–24th, and that he proposed, as in former cases, to prepare and publish an English translation of the Report —Approved.

Read—Letter 1500 from the observer at St. Helena as to his remuneration—Mr. Scott was instructed to prepare by next meeting a report on the St. Helena observations since the supply of instruments. (Minutes, 1891, p. 51.)

Submitted—The following reports :—

(M.O. 1870.)

REPORT OF INSPECTIONS IN IRELAND AND WALES, 1894.

I have to report that I have completed my inspections, with the exception of the following places which were left unvisited :—

Telegraphic stations.—Donaghadee and Roche's Point.
Weekly Weather Reports stations.—Foynes, Kilkenny, and Llandovery.
Station of the Second Order.—St. David's.

The following is the Report of my visits :—

Holyhead, visited September 19th.—The new observer, Mr. Chope, had his station in very good order. He seems attentive and careful, and promises to be a good reporter.

Dublin, Phœnix Park, visited September 20th.—The observer was on leave, but the substitute, Corporal Blight, seemed competent and intelligent. The station was, as usual, in good order.

Dublin, Fitzwilliam Square, visited September 21st.—This station was, as usual, in perfect order.

Dublin, Glasnevin Gardens, visited September 21st.—The station is in good order, but I have had to request the Superintendent to enclose with railings a space larger than the present area, cases having occurred of instruments being lifted from outside, and therefore of probable disturbance of thermometer indices.

Lissan, visited September 22nd.—The station was in good order. Sir N. Staples takes the barometer readings himself.

Armagh, visited September 22nd.—This station calls for no remark, it was in the usual good order.

Colebrooke, visited September 24th.—This station is in good order, but there is no substitute in case of illness of the observer.

Londonderry, visited September 25th.—The station was in good order, but I fear the observer will shortly leave the locality, as he is resigning his appointment.

Malin Head, visited September 26th.—The observer is fairly good, but has not, as yet, made proper use of the self-recording aneroid I left there in 1893. I fear he may, probably, leave the station on the ground of health and exposure in winter.

Edenfel, visited September 27th.—This weekly weather report station was in good order.

Markree, visited September 28th.—This station was in good order. I tested the assistant, and found her able to read the instruments quite correctly.

Belmullet, visited October 1st.—The station was in good order. Difficulty has been found in obtaining correct telegrams when the observer is on leave, but there is a prospect of an improvement in this, as one of the younger sisters shows considerable aptitude in the work.

Currygrane, visited October 3rd.—The former observer, S. Lecky, had left in August without sufficiently instructing his brother, W. Lecky, who succeeded him. I had, therefore, to instruct him carefully, and I hope he may turn out satisfactory.

Arley Cottage, visited October 4th.—I am glad to say I found Major Maxwell at home. The instruments are in good order, and the observations carefully kept.

Valencia, visited October 10th.—I have found this station, as regards the telegraphic reports, in good order. I am glad to say that the telegraphic service from Cahirciveen is more prompt and regular than it was from the Island.

Parsonstown, visited October 12th.—I am sorry to say that the reports from this station during the past year have been very unsatisfactory, the observer having been very careless. I have, with Lord Rosse's approval, dismissed him, and appointed another youth in his place for the telegraphic work, and yet another for the climatological observations. These two boys appear intelligent and willing, and Dr. Bœddicker, the astronomical assistant, has kindly promised to see to their further instruction. The instruments were clean and in good order.

St. Anne's Head, visited October 15th.—The observer here is a new man, but had been well instructed by his predecessor. There is a difficulty about finding a substitute in case of illness. There are two lighthouses and four keepers, but most of these men are anxious to leave the station owing to its loneliness, and are not willing to undertake the work. The instruments are all in very good order.

(Signed) ROBERT H. SCOTT.

TELEGRAPHIC, WEEKLY WEATHER REPORT, and SECOND ORDER STATIONS, 1894.

Corrections to be applied to the readings of :—

STATIONS.	Dry Bulb.	Wet Bulb.	Spare Therm.	Max. Therm.	Min. Therm.	Grass Min.	REMARKS.
Armagh - -	−0°·3	−0°·2	—°	−1°·1	—°	+0°·1	
Belmullet - -	−0·2	−0·1	—	−0·1	—	−0·1	
Brookeborough -	−0·5	−0·6	—	+0·1	−0·3	—	
Dublin (City) - -	−0·3	−0·3	—	−1·0	+0·2	—	
Dublin (Glasnevin) -	−0·2	−0·1	—	−0·3	+0·5	+0·9	
Dublin (Phœnix Park)	−0·4	−0·2	−0·7	−0·1	−0·1	+0·3	
Edenfel (Omagh) -	—	—	—	+0·4	+0·2	—	
Edgeworthstown -	−0·3	−0·3	—	+0·7	+0·7	+0·7	
Holyhead - -	−0·5	−0·2	—	−0·5	+0·3	−0·3	
Lissan - - -	−0·1	−0·1	—	+0·1	+0·1	—	
Londonderry - -	−0·1	−0·1	—	+0·3	+0·3	—	
Malin Head - -	−0·2	−0·1	−0·3	+0·1	−0·5	—	
Markree Castle -	−0·1	−0·1	—	−0·5	+0·5	—	
Mount Nugent -	−0·1	−0·1	—	+0·4	+0·4	+0·3	
Parsonstown - -	−0·3	+0·2	—	+0·1	+0·1	—	
Valencia Tel. Report	−0·6	−0·5	—	−0·4	+0·4	—	

(M.O. 1835.)

Report of Inspection of Scottish Stations for Year 1894.

Barometers.

The barometers at the stations were compared with inspector's standard No. 690, which was in good order throughout the inspection as shown by comparisons with the standard in Edinburgh at the beginning and again at the end of the inspection. I have to report that the barometers continue to be correct, and are kept in the same good order as stated in last year's report. Table I. gives the comparisons, with corrected readings, of No. 690, the readings of the station barometer not being corrected.

Table I.

Stations.	Inspector's Standard No. 690 corrected.	Reporting Barometer uncorrected.	Check Barometer uncorrected.	Remarks.
	Inches.	Inches.	Inches.	
Fort William	29·515	29·520	—	
Deerness	29·740	29·762	—	
Dunrossness	29·407	29·396	29·402	
Wick	29·984	29·980	29·920	Check barometer at higher level.
Dunrobin	30·048	30·048	—	
Lairg	29·512	29·496	—	
Stornoway	29·855	29·850	29·850	
Glencarron	29·572	29·576	—	
Nairn	30·192	30·182	30·190	
Gordon Castle	30·207	30·208	—	
Aberdeen	30·260	30·264	30·264	
Lednathy	29·406	29·408	—	
Dundee	30·030	30·030	—	
Marchmont	29·156	29·160	—	
Ladylaw	29·930	29·930	—	
Wolfelee	29·763	29·760	—	
Glenlee	30·276	30·280	—	
Ardrossan	30·504	30·505	—	
Rothesay	30·260	30·260	—	
Poltalloch	30·318	30·290	—	
Leith	30·097	30·098	30·100	
Ochtertyre	29·962	29·950	—	

Thermometers.

The minimum thermometers were carefully examined with the result that all were found in good order with the exception of the Stornoway minimum which was badly out of order, as explained in special report of this station. It reflects much credit on the observers that this important thermometer, so liable to go wrong, is so constantly watched and kept in order.

Table II.

Stations.	Standard Thermometer, No. 4433.	Dry Bulb.	Wet Bulb.	Spare Thermometer.	Max. Thermometer.	Min. Thermometer.	Time in Water, in Minutes.	Change of Temperature	Remarks.
	°	°	°	°	°	°			
Fort William	60·4	+0·2	+0·2	—	+0·1	+0·0	180	+0·2	
Fort William Observatory.	60·4	—	—	—	+0·0	−0·6	180	+0·2	
Deerness	58·6	+0·1	+0·1	—	−0·9	−0·3	85	Uniform.	
Dunrossness	57·0	+0·6	+0·3	+0·6	+0·0	−0·2	150	Do.	
Wick	56·0	−0·4	−0·5	—	+0·0	+0·0	80	Do.	
Dunrobin	59·4	+0·0	+0·1	—	+0·1	−0·3	120	−0·2	
Lairg	58·0	+0·3	+0·3	—	−0·1	+0·1	75	+0·3	
Stornoway	56·2	+0·6	+0·6	—	−0·4	−0·6	165	+0·3	
Glencarron	53·9	+0·1	+0·1	—	+0·0	+0·0	90	+0·3	
Nairn	55·6	+0·7	+0·8	+0·2	+0·1	−0·1	90	+0·4	
Gordon Castle	55·2	+0·1	−0·1	—	+0·1	−0·2	105	Uniform.	
Aberdeen	57·0	+0·3	+0·3	—	+0·2	+0·3	105	Do.	
Lednathy	53·4	+0·2	+0·2	—	+0·2	−0·4	100	Do.	
Dundee	57·0	−0·5	−0·3	—	+1·4	−0·4	80	+0·2	
Marchmont	52·0	+0·0	−0·1	—	+0·0	+0·0	240	+0·5	
Ladylaw	60·4	+0·0	+0·0	—	+0·0	+0·1	165	+0·3	
Wolfelee	51·0	−0·2	−0·2	—	+0·2	−1·0	100	+0·4	
Glenlee	52·8	+0·2	+0·2	—	−0·1	+0·0	120	+0·2	
Ardrossan	60·1	+0·2	+0·2	—	−0·2	−0·2	80	Uniform.	
Poltalloch	57·5	+0·3	+0·3	—	+1·0	+0·0	90	Do.	
Rothesay	52·9	+0·0	−0·1	—	−0·1	−0·1	110	Do.	
Leith	54·7	+0·1	+0·1	—	−0·1	−0·2	75	Do.	
Ochtertyre	57·6	+0·0	−0·1	—	+0·0	+0·0	160	Do.	

Hygrometers.

The dry and wet bulbs were in very good order at all the stations, as shown by the readings made immediately on opening the screens at the time of inspection, and compared with the hygrometric conditions of the atmosphere at the time of inspection.

Notes of Inspection of the Stations.

Fort William, August 8th, 1894.—The instruments are in excellent order, and the observations are made with strict punctuality and correctness.

A new Stevenson's screen was got to replace the old one to which the thermometers were shifted on July 19th. The seismometers were set up in the autumn of last year. Several changes have been made with regard to Beckley's gauge, with the result that more satisfactory readings are now obtained. The standard barometer was sent to Kew in March to be overhauled, and was returned to Fort William on July 19th. While at Kew, inspector's standard No. 690 was used instead.

Deerness, August 11th.—The instruments are in excellent order, and the observations are made with great care and intelligence.

Dunrossness, August 16th.—The instruments are in very good order, and much care is given by the observers to secure punctuality and correctness. The small barograph is in good order, and the readings required by the office will be forwarded in a fuller manner than heretofore.

Wick, August 17th.—The instruments are in remarkably good order, and much intelligence and care is manifested by the observer. Improvement as regards an earlier despatch of the daily telegram is promised.

Dunrobin, August 18th.—A new hygrometer with opal scales was added in June, this owing to close proximity to the sea being very desirable. The instruments are all in good order, and the observations are made with care and intelligence.

Lairg, August 20th.—The instruments are well attended to, and the new observer understands the work of observing well.

Stornoway, August 22nd.—The minimum thermometer was found with about 10°·0 of the spirit lodged near the top of the column, which was stated to have been seen two days previously, but the observer delayed putting it right till the time of the inspection, otherwise the instruments were in good order, and the observations appear to have been made with care. As Mr. Forbes the observer is leaving Stornoway, sometime was spent in making inquiries and personally seeing the different applicants for the post.

Glencarron, August 23rd.—The instruments continue to be kept in excellent order, and the observations made with much intelligence and with scrupulous care.

Nairn, August 24th.—The instruments are in good order, and the observers make all endeavours to secure correctness and uniformity in the readings.

Gordon Castle, August 24th.—The instruments are all in good order, and the observations made with much care and intelligence.

Aberdeen, August 25th.—The Stevenson's screen has been painted. The instruments at this station and observatory are in excellent order, and the observations are made with exemplary care and exactness.

Lednathy, August 27th.—The instruments are in very good order, and the observer is remarkably shrewd, accurate, and intelligent.

Dundee, August 28th.—The instruments continue to be kept in very good order, and much intelligence and care is shown in the observations.

Marchmont, September 27th.—The instruments are in remarkably good order and correctly read by the new observer, except the barometer, which, however, was read in a way by which the correct reading is easily ascertained.

Ladylaw, September 27th and 28th.—The instruments are in excellent order, and much enthusiasm, care, and intelligence is manifested in carrying on the work of observing.

Wolfelee, September 28th.—The instruments continue to be well kept, and carefully and correctly observed. At this station, the observations were interrupted for two or three months in 1893, but were resumed under the same observer and with the same instruments in the autumn of that year.

Glenlee, September 29th.—The instruments are in excellent order, and the work of observing is well carried out.

Ardrossan, October 1st.—The instruments are in good order, and the observations are carefully made. The heights of two bench marks, between which Mayes' house is situated, have been sent with an instruction to have the height of the barometer measured from one or other of them.

Poltalloch, October 2nd.—The instruments are in very good order, and the observations are carefully and intelligently made by the new observers.

Rothesay, October 3rd.—The instruments are all in very good order, and much care is given to secure accuracy and punctuality in making the observations.

Leith.—The instruments are all in very good order, and much care is given by the observers to give satisfaction with the observations. The additional notes asked for will in future be added to the daily telegram.

Ochtertyre, October 11th.—The instruments are all in excellent order, mostly in duplicate, and much enthusiasm is displayed in the whole work which is well done. A new set of underground thermometers from 3 to 48 inches has recently been added.

(Signed) A. Buchan.

(M.O. 1853.)

SIR, October 16, 1894.

I HAVE the honour to submit herewith the following reports upon the inspection of the stations visited by me this year.

I am, &c.

R. H. Scott, Esq., F.R.S. (Signed) R. H. CURTIS.

Newquay, September 3rd.—The sunshine recorder here has not been attended to of late as carefully as could have been wished, and I pointed out to the observer the necessity for more punctual and careful attention to the changing of the cards. The wooden stand having become warped, I readjusted the recorder and secured it in its position.

Scilly, September 6th.—The instruments were in good order except that the wet bulb had too thick a covering upon it. The observer read his instruments and reduced his barometer readings quickly and correctly. As requested, I directed his attention to the use of the self-registering aneroid, and I have reason to think a more intelligent use will be made of that instrument in the future. I also gave him some instruction on the subject of upper clouds, which I found he much needed. The sunshine recorder has a perfect exposure, but a scale is required for tabulating the cards.

Plymouth, September 8th.—The minimum thermometer had half a degree of spirit at the top of the tube; but, with this exception, the instruments were all in good order, and they are carefully attended to. I dislodged the spirit before leaving. Since the last inspection the barometer had been removed to the observer's new residence; I found it hung in a bad light, and therefore arranged for its removal to a better light on the opposite side of the room. The observer expects the Corporation will shortly procure a self-recording anemometer, and, at his request, I visited two alternative sites proposed for its erection, either of which would be very good. The observer also hopes to shortly commence daily observations of sea temperature from a hospital hulk moored in the Sound.

Prawle, September 11th.—The observer here had been changed since the station was last inspected. The wet bulb was very badly mounted, and the bulb was immersed in a vessel containing fully half-a-pint of water; with this exception, the instruments were in good order. The observer read correctly, and reduced his barometer reading properly, although not very quickly; his deputy also did the work accurately, but was very slow. I found that hitherto the wind directions reported have been "magnetic" instead of "true," but this will in future be altered. I also gave the observer some instruction in the matter of upper clouds. The observer appeared to me to be anxious to understand his work, and to do it satisfactorily. A spare thermometer is required here.

Arlington Court, September 12th.—The wet bulb at this station was badly mounted, and *twine* was in use instead of cotton wick, the result being that the bulb was not kept properly moistened. The maximum thermometer read half a degree too high, and the minimum as much too low, but in neither case could I detect any apparent cause for the large errors. The observer read correctly, and appears to do his work carefully and neatly.

Montpellier, Bristol, September 13th.—The instruments here were in excellent order, and Mr. Jones is a very good observer. As requested, I examined very carefully the maximum thermometer, which I found to be a very good instrument. The site of the station is, however, not the best for temperature or rainfall observations.

Cirencester, September 14th.—Except that the thermometer stems were absolutely devoid of any black in the divisions, the instruments were all in good order. The sunshine recorder was in no way fastened to its stand, and was, therefore, always liable to be moved in changing the cards, or by wind; and the assistant observer, whom I saw (Prof. Ohm being absent on vacation), promised to have it at once secured by a couple of iron cramps.

Stokesay, September 15th.—The instruments here were in fairly good order except the solar radiation thermometer, which had become useless. The barometer was tested by my standard, with which it very closely agreed. The thermometer screen is in a dilapidated state, and Mr. La Touche has promised to have another substituted for it. This station is very badly situated for wind observations.

Llandudno, September 17th.—A new position has recently been found for the sunshine recorder, which is now under the care of Mr. MacMaster, at West Bay. The situation is an excellent one, the instrument having a very good exposure at all seasons, and the observer is very punctual and careful in attending to the changing of the cards. A scale for tabulating the cards is required.

(Signed) R. H. CURTIS.

STATION.	Reading of Standard.	Corrections to be applied to the Readings of the						REMARKS.
		Dry Bulb.	Wet Bulb.	Spare Therm.	Max. Therm.	Min. Therm.	Gr.ss Min.	
	°	°	°	°	°	°		
Scilly - - -	60·0	−0·7	−0·2	0·0	−0·7	0·0	--	
Prawle Point - -	59·6	−0·5	0·0	*	+0·2	0·0	--	* No spare thermometer.
Stokesay -	58·7	−0·2	−0·3	—	−0·7	+0·3	+1·1	
Plymouth - -	57·8	0·0	−0·1	—	0·0	+0·5	+0·5	
Arlington Court -	60 3	0·0	−0·1	—	−0·5	+0·5	—	
Bristol - - -	58·0	0·0	0·0	—	+0·2	0·0	—	
Cirencester - -	55·0	0.0	0·0	—	+0·1	+0·1	—	

(M.O. 1934.)

Meteorological Office,
October 16, 1894.

SIR,

I BEG to submit herewith the Report of my inspection of various English Stations.

I am, &c.

To (Signed) JOHN A. CURTIS.

R. H. Scott, Esq., M.A., F.R.S.

TELEGRAPHIC REPORTING STATIONS.

North Shields, September 4th.—The outdoor instruments have been removed to the opposite side of the Dockwray Square enclosure, in order to lessen the risk of accidental damage by children at play. There is, however, still some liability in this direction, and I suggest that a letter be written to the Secretary of the Committee having control of the Square, asking him to use his influence to prevent such damage as far as possible. The removal will not in my opinion affect the readings. The instruments were all in good order, except the rain-gauge which needed repair. This it was promised should be seen to at once.

York, September 7th.—I formed a favourable impression of Mr. Wright, the observer, who read the instruments accurately and quickly, and who appeared to me to be anxious to do well. The wet-bulb though properly mounted was coated with deposit. The most serious defect at this station is the position of the thermometer screen which ought, in my opinion, to be removed about 20 yards to the south east where it will have a much freer exposure. I recommend that efforts be made to effect this change. See other report.

STATIONS OF THE SECOND ORDER.

Aysgarth, September 6th.—The thermometer screen is now much sheltered by a shrubbery to the west, but I did not think it advisable to recommend any change. The outfit of this station is admirable, and the observations are carefully taken.

Bramley, August 22nd.—This is a new station, the instruments at which are the property of Mr. C. Bell, of Lockner Holt, Chilworth, who is obliged to discontinue observing for the present. The observer at Bramley is Mr. J. Bartlett, M.A. He is most enthusiastic in the work, and the station promises very well indeed. I found the wet-bulb thickly coated, and requested that rain water only be used in future to moisten it. A hill rises immediately behind the station which must affect the direction of the surface wind when from any point between south and west. The thermometer screen is on the Stevenson principle, but not of the standard pattern. It was painted grey at the time of my visit, but Mr. Bartlett promised to have it painted white later on. The rain gauge is not quite satisfactory.

Cronkbourne, Isle of Man, August 29th.—This is an excellent station alike for position, outfit, and management. The only faults I noticed were that the wet-bulb had too much muslin upon it, and that on the day of my visit, the sunshine card was not quite accurately set in the groove. Mr. Moore promised to have a white line placed on the frame of the recorder as being easier seen at night.

Durham, September 5th.—Mr. Carpenter is a very competent and careful observer. Everything was in good order except that the rain-gauge was rather loose, and that the grass minimum thermometer had about 1° of separated spirit. This last defect I rectified, and Mr. Carpenter promised to fix the rain-gauge firmly. There is a large shrub on the south of the thermometer stand (which is one of the "Glaisher" pattern), and close to it, but I do not think the readings are much affected by it, if at all.

Epsom, July 27th.—The observers at this station have recently been changed. Those now appointed, who are students at the College, are intelligent lads, with, however, no knowledge of meteorology. I spent a considerable time with them, and went as fully as possible into the details of the work. The wet-bulb was very improperly mounted and the grass minimum had spirit separated, which, with some difficulty, I corrected. The other instruments were in good order. Both the observers set and read the instruments accurately and quickly.

Gilcrux, near Maryport, September 1st.—This is a new station. The barometer has a large error, but a new one has since been purchased from the Office, and is now in use. The out-door instruments are good, and are well exposed in a garden at the back of the house. There is a difficulty about the 9 p.m. readings, but I hope this may be overcome. Mr. Monkhouse is not, at present, sure of being able to observe later than 8 p.m. The observer is most enthusiastic in the work. He reads the instruments accurately and quickly and I think useful observations may be expected from this station. The rain-gauge was not quite firmly fixed.

Heysham Hall, August 31st.—The exposure of the out-door instruments at this station is not quite satisfactory. The thermometer screen is in a kitchen garden, rather too near a greenhouse, and on the day of my visit was sheltered by some tall chrysanthemums, in pots, which, it was promised, should be removed. The screen is too small, and I gave instructions that the dry-bulb and wet-bulb thermometers should be brought away from the back louvres, against which they at present rest. The screen was placed over fine cinders, but Mr. Lomas promised to replace these with grass. The observer has been in the habit of setting the barometer from ·02 to ·03 in. too low, but this error will not, I think, be repeated. I endeavoured to settle some queries on back returns, but found that the entries in the pocket observation book had, from motives of economy, been rubbed out This practice has now been discontinued.

Manchester, August 28th.—This station was in excellent order.

Mr. Hazzlewood, the manager of the Corporation Depôt, in the Oldham Road, where the observations are taken, was absent from Manchester, but I saw the deputy observer, and went over the details of the work carefully with him, giving such instructions as were necessary.

It is a misfortune that arrangements cannot be made for evening readings at this very well-managed station.

Prestwich, August 27th.—At this station the position of the out-door instruments has been entirely changed. They now stand in the front of the Asylum, perhaps a quarter-of-a mile away from the old site, and on the ground about 15 feet higher. The present position is exceedingly good, the instruments were in excellent order, and the observations appear to be very carefully attended to. A new thermometer screen is now in use. The sky was quite overcast at the time of my visit, and I was unable, therefore, to test the adjustment of the sunshine recorder. There are some newly-planted shrubs near the instruments, but these Dr. Clunn promised should be kept low.

St. Helens, August 28th.—All the instruments were in good order and the observations are taken with care. The thermometer screen, however, stands over limestone chippings, and I requested that these might be replaced by turf. This Dr. Robertson (who personally takes the observations) promised to try and get done. The observer hopes soon to obtain a sunshine recorder.

Seaham, September 5th.—All the instruments, including the barometer, are at the cemetery, and Mr. Leith, the superintendent of the cemetery, takes the observations, while Mr. Aird fills up the sheets. I met both gentlemen and carefully tested Mr. Leith's readings. He read the barometer a little in error at first, but this, I think, will not be repeated. The thermometer screen was so much sheltered by a young tree to the south of it (and right over it) that I advised its removal to a better site which I pointed out. Mr. Aird promised to have the change made at once. The grass under the thermometer screen was quite long, and the wet-bulb was coated with deposit.

Sheffield, September 8th.—Everything was in excellent order at this station and the observations are made with great care and intelligence. The thermometer screen is very well exposed on a lawn in front of the museum, but a flagstone is placed underneath it. This I recommended should be covered with a mat so as to reduce as far as possible the effect of radiated heat. The barometer is a Fortin, and the surface of the mercury was rather dull. Town water has sometimes been used to moisten the wet-bulb, but it was promised that in future only rain water or distilled water should be employed for this purpose.

Tealby, September 11th.—I spent a considerable time at this station and went into details of the work pretty fully with the observer, Rev. S. Lewin, M.A. Some questions that had arisen on past observations I settled by reference to the original memoranda, and pointed out at the same time how similar errors might in future be avoided. I suggested the use of a pocket observation book, and promised that one should be sent. The worst feature about this station is the frequent unpunctuality of the evening observations, but this I fear cannot be wholly avoided. The wet-bulb was foul and not quite properly mounted.

York, September 7th.—The thermometer screen at this station is sheltered by trees growing to the south and south-west which cut off the sun's rays from the screen from about 1 p.m. In consequence, the afternoon maximum is, I believe, often missed. A much better site for the screen is available nearer the rain-gauge, and I recommend that efforts be made to effect a change The screen is overcrowded with instruments and in consequence the maximum temperatures reported by telegraph are usually higher than those shown in the monthly reports, sometimes by as much as 3° or 4°. The wet-bulb was foul. The rain-gauges are 1 foot 9 inches high, but being informed they had always been at the same height I recommended no change. Mr. Wright seemed anxious to do well.

Stations of the Third Order.

Alnwick Castle, September 3rd.—The temperatures hitherto sent us are from a large Six's thermometer hung outside the library window, 22 feet above the ground. I dismounted this instrument, and on testing it in water in the usual way, found it to be sensibly correct. There are, however, other thermometers well exposed in a Stevenson screen in the garden, near the rain-gauge. I tested these also and found them to be excellent instruments. I was informed that there would probably be no difficulty in having the observations from these instruments sent to us instead of those from the "Six," and I strongly recommend that Mr. Willyams be asked to make this change. The temperatures at present reported certainly do not correctly represent the climate of the station. I requested that the long grass around the rain-gauge might be cut short, and this it was promised should be done.

Bawtry (Hesley Hall), September 10th.—The instruments used for the observations sent to the Office were in good order. Mr. Whittaker thinks of purchasing a sunshine recorder and an anemometer, and at his request, I advised as to the best positions for these instruments.

Durham.—Everything was in good order at this station except that the rain-gauge was rather loose, and that the grass minimum thermometer had about 1° of separated spirit. *See* other Report.

Market Rasen, September 11th.—This station supplies only Rainfall observations. I found the rain-gauge loose and not quite level, but these defects I corrected. The measuring glass is broken but the part that remains—about half—is accurate. The exposure is not quite satisfactory, the gauge being sheltered to some extent by the garden walls, &c.

North Allerton, September 6th.—This station supplies only rainfall observations. The rain-gauge in its present position is much sheltered, but there is a much better site available which I pointed out, and which I hope may be adopted. The measuring glass needs a correction of + ·01 inch, which Mr. Stead regularly applies.

Prestwich, August 27th.—The positions of the thermometers and rain-gauge have been changed as explained in other Report.

The instruments were in excellent order and very carefully attended to.

Proposed Station.

Solihull, near Birmingham, September 12th.—This is a new station, not yet accepted by the Office; the letter offering the observations is M.O. 1584/94. Mr. Boothroyd, the observer, has bought a capital set of outdoor instruments, but has, as yet, no barometer. The exposure of the instruments is good, and I think the observations are very carefully taken. The thermometer screen at present is rather too near the house, and I selected a better site, to which it was promised the screen should be at once removed. Mr. Boothroyd cannot, at present, promise 9 p.m. observations, but I recommend the station be accepted as one of the Third Order, or for Weekly Weather Report purposes.

Barometer Comparisons, 1894.

Stations.	Inspector's Standard Barometer corrected (Adie, B. T. 779).	Reporting Barometer Uncorrected.	Check Barometer Uncorrected.	Reporting Barometer.		Remarks.
				Correction required to reduce to Inspector's Standard.	Correction hitherto used.	
Alnwick Castle	—	—	—	—	—	
Aysgarth	29·525	29·534	—	−·009	−·017	
Bawtry (Hesley Hall)	30·390	30·416	—	−·026	—	
Bramley	29·815	29·814	—	+·001	+·002	
Cronkbourne	30·200	30·200	—	+·000	+·000	
Durham	29·795	29·788	—	+·007	−·002	
Epsom	—	—	—	—	—	
Gilcrux	29·905	29·790	—	+·115	+·068	Mercury had escaped during transit of inst. from Kew.
Heysham Hall	30·120	30·122	—	−·002	−·005	
Manchester	30·115	30·104	—	+·011	+·001	
Market Rasen	—	—	—	—	—	
North Allerton	—	—	—	—	—	
North Shields	30·055	30·038	30·028	+·017	—	
Prestwich	29·840	29·830	—	+·010	·000	Comparison not very reliable owing to difficulty in hanging standard.
St. Helens	30·180	30·188	—	−·008	−·009	
Seaham	29·995	29·996	—	−·001	−·014	
Sheffield	29·545	29·542	—	+·003	+·001	
Solihull	—	—	—	—	—	
Tealby	30·095	30·086	—	+·009	+·004	
York	29·990	29·984	29·986	+·006	+·007	

Thermometer Comparisons, 1894.

Corrections to be applied to the readings of—

Stations.	Standard Corrected. (Neg. B. T. 5012.)	Dry Bulb.	Wet Bulb.	Spare Therm.	Max. Therm.	Min. Therm.	Grass Min.	Remarks.
Alnwick Castle	...	—	—	—	0·0	0·0	—	Six's maximum and minimum.
	61·8	−0·5	−0·5	—	−0·8	−0·3	—	Instruments in Stevenson screen.
Aysgarth	52·8	—	—	—	—	0·0	—	
Bawtry (Hesley Hall)	57·3	−0·7	−0·2	—	−0·5	+0·1	—	
Bramley	60·1	+0·1	+0·1	—	−0·2	+1·1	—	
Cronkbourne	63·2	−0·5	−0·5	—	−0·2	+0·4	—	
Durham	53·7	−0·6	−0·6	—	−0·4	+0·4	+0·1	
Epsom	64·6	−0·2	−0·2	—	−0·1	−0·2	0·0	Before spirit was got back correction was +1°·4.
Gilcrux	58·2	−0·2	−0·2	—	−0·3	−0·1	+0·2	
Heysham Hall	64·2	−0·4	−0·2	—	−0·3	+0·3	−0·1	
Manchester	57·5	+0·3	+0·2	—	+0·4	+0·4	+0·6	Earth thermometers, 1 ft. +0·2; 4 ft. +0·2.
Market Rasen	—	—	—	—	—	—	—	
North Allerton	56·2	—	—	—	−0·1	+0·7	—	Six's thermometer, in garden stand.
North Shields	57·6	−0·3	0·0	—	−0·4	+0·8	—	
Prestwich	61·8	−0·3	−0·2	—	0·0	−0·1	—	
St. Helens	58·7	−0·2	−0·2	—	−0·1	+0·4	—	
Seaham	56·0	−0·7	−0·6	—	+0·4	+0·5	—	
Sheffield	53·4	−0·3	−0·4	—	−0·2	+0·1	—	
Solihull	56·8	−0·1	+0·1	—	+0·2	+0·8	—	
Tealby	59·6	−0·2	−0·2	−0·2	−1·2	+0·5	—	
York	54·3	−0·7	−0·6	—	−0·3	+0·4	—	Maximum and minimum thermometers for Second Order Return.
					−0·9	+0·4	—	Ditto for Telegraphic Reports.

(M.O. 1854.)

INSPECTION of ANEMOMETERS at SCILLY and HOLYHEAD.

SIR, October 11th, 1894.

I BEG to submit herewith reports of my inspection last month of the anemometers at Scilly and Holyhead.

I am, &c.
(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

Scilly, September 4th–7th.—The anemometer had been partially dismounted on August 18th, and the pencils sent to Mr. Munro to have silver helices substituted for the brass ones hitherto used. (Minutes, p. 84, 1893.)

I found those portions of the instrument awaiting me at Scilly, Mr. Munro having returned them just prior to my arrival.

I at once got the pencils into their places, and by the evening of the 4th had the instrument again at work, deferring the overhaul of the bearings, &c., until the 5th.

I found the anemometer in a much better condition than it was in last year, and Mr. Hicks had apparently kept the bearings properly oiled, and followed the instructions which I gave him on that occasion. A mixture of paraffin and sperm oil which I then used had kept fluid and clean, and seemed to have answered very well; but the paint used last year had not stood well, and the whole of the exterior of the instrument again required to be painted, and this I requested should be done.

I dismounted the whole of the instrument, and carefully examined every part of it. A little adjusting was required with the new pencils, and I also made a small alteration in setting up the clock, by which its going was improved. Asbestoline was used to all the bearings, and the brake box was also filled with it, all the old oil being first removed. The observer complained that it was difficult to entirely prevent the rain from reaching the recording apparatus during south-easterly gales, and I therefore tried to improve the fitting of the door, and I think successfully.

Since the inspection the instrument has gone most satisfactorily. The silver helices answer very well indeed, the traces being black and distinct, and thus far without the least sign of a faint trace, although some damp weather has been experienced.

Holyhead, September 18th–22nd.—The Robinson anemometer at work here was made by Beck, and has been in use since 1869. Some of the external parts have been renewed, and they are now all in good condition, but the recording portion of the instrument, besides being less conveniently arranged than in more modern instruments, is, after its 25 years' constant work, in a less satisfactory state.

The anemometer is, however, carefully looked after by Mr. Davies, the attendant, under Mr. Cotton's direction.

I had been asked to look specially for the cause of the occasional failure of the velocity trace, and also to try and ascertain the cause of a large time-error commonly shown by the traces. The first fault I found to be due to the construction of the instrument, but I was able to show the observer how to prevent it in future; whilst the second was due to the fact that the diameter of the cylinder was too small, and it could only be got over by causing the clock to gain about 10 minutes in the 24 hours, which was therefore done.

The entire instrument was dismounted and carefully examined and cleaned, and was left in good order.

I would beg to suggest that the recording portion of the instrument, including the clock and cylinder, should be returned to Munro for renewal and repair. The arrangement for raising the pencils is a bad one, and the cause of the occasional loss of trace; the time-pricker is useless, and gives much trouble in setting the sheets; one of the pencils has been locally repaired, and the spiral is not quite true; and there is a large amount of "backlash" in the gearing. The rods connecting the reducing gear with the pencils are about 11 feet long, and I think it would be an improvement to cut them, and insert a Hook's joint in the middle of each; and some of the pivot holes of the clock require to be re-bushed.

The exterior portions of the anemometer need repainting, and the cap which fits upon the top of the lantern, and which carries the pillar, required to be caulked; Mr. Cotton promised to have both done.

Before leaving Holyhead, I noticed that the vane did not appear to be pointing truly into "the "eye of the wind," and I made some experiments, which I repeated with Mr. Cotton, to test the truth of the supposition. There appeared to be no doubt that the vane was not correct, and that with a fresh wind from E. it pointed to E.N.E.; the velocity being about 30 miles per hour.

I found, however, that the tower, and the curved top of the lantern, caused some local eddies which I was not sure I could properly guard against without a better appliance than was ready to my hand; but Mr. Cotton has promised to test the matter again more fully with such an appliance shortly, and any alteration of the pencils has been deferred until that has been done.

Bridled Anemometer.

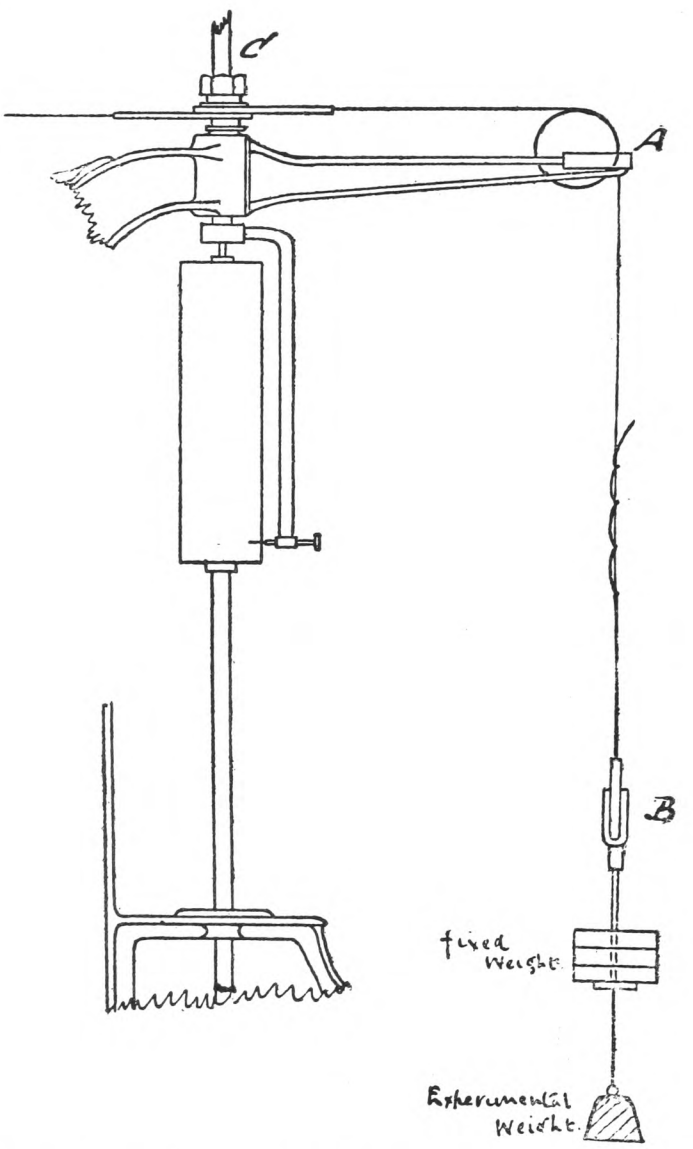
The bridled anemometer had not been dismounted for the purpose of being cleaned for several years, and some parts of it were therefore, as might have been expected, in a very unsatisfactory state.

The oil in the upper box, containing a set of friction balls which carried the entire weight of the cups and the shaft, had become of the consistence of glue, and consequently the balls could not revolve and were useless for the purpose they were intended to serve. Congealed oil had also to be cut off the spindle, and in addition a good deal of oil in a very sticky condition was on the cords which carried the weights, at the part where they wound round the pulleys.

I first of all dismounted the instrument entirely, and had every part thoroughly cleaned and properly oiled. Some of the cups were badly dented, apparently by stones thrown by boys, and these I restored to their proper shape before replacing them. I found also that the friction balls in the upper bearing fitted too tightly, and by removing one ball I greatly improved the bearing.

After refitting the instrument, I proceeded to determine the true zero point of its scale. I was shown a mark upon the base of the cylinder which I was told had always been regarded as the zero, although it did not appear to me to be such a mark as an instrument maker would have put for the purpose. I think it most probable that originally a zero was omitted, and that the mark I was shown was made empirically by those who first had charge of the instrument; or it may even have been a casual mark found there and adopted as the zero. Before leaving I cut it into the metal more sharply.

The method I adopted was as follows:—



The "snails" of the instrument having been designed to give a record of velocity, and not of pressure, any force applied to the spindle should move the pencil through a distance proportional to its square root.

I therefore placed upon the cylinder a sheet of paper, setting it to the mark used as zero; and then applied to the cord coming from the pulley upon the spindle (C) a series of weights, attaching them to the cord at a point about midway between the fixed pulley at the end of the arm (A), and the movable pulley (B), carrying the weights which form part of the instrument.

The weights I used were $\frac{1}{4}$ lb., 1 lb., 4 lbs., 9 lbs., 16 lbs., and 25 lbs., which (with the exception of the $\frac{1}{4}$ lb. weight) should have given me a series of equal distances between the points at which the pencil came to rest. The experiment was made with the pulley on each side of the instrument separately. I took great care to apply the weight gradually, and to remove it in the same way; noting the point at which the pencil came to rest when the weight was removed as well as when it was applied. The cylinder was moved between every operation so as to secure a distinct record of each.

The true zero should be five times the mean distance between the points, below the indication made by the pencil when the 25 lb. weight was applied; and this I find places it 0·7 inch below the mark hitherto used. In other words, the velocities hitherto measured are all about four miles too low.

I found that there is a very large amount of friction to be overcome in the instrument. The $\frac{1}{4}$-lb. weight produced no effect upon the pencil at all. When the 1-lb. weight was applied, no

movement took place until the instrument had been well tapped, to overcome the friction. With the 4-lb. weight, the pencil stopped at a point equal to about two miles on the scale below the position it assumed after being tapped; but with the heavier weights used, tapping produced no change at all in the position of the pencil.

The point to which the pencil returned, when the weights were removed, and without tapping the instrument, was practically always the same, and was equal to the position to which a pull of a little less than 2 lbs., applied to the spindle, should have raised it.

The cord used for supporting the working weights of the instrument is, without any doubt, a principal cause of the excessive friction. It is too thick for the pulley (a grooved one) upon which it is wound, and I could distinctly feel the "bite" of the double cord upon itself as the weights were removed. The effect was no doubt increased also by the fact that the cord was wet with oil. As I have already stated, I found the portion of the cord around and near the pulley covered with *sticky* oil, and although I removed this, and had it well washed with paraffin, it of course remained quite wet.

To remove this source of error, I beg to propose that a *wire* cord be substituted for the one now in use. I have obtained and tried two or three samples of wire cord, and have found one which possesses quite enough flexibility with plenty of strength for the purpose, and as it is of only about one-half the diameter of the present cord, there would be ample room for it on the pulleys. In addition to this, it could be kept clear from oil, which is always liable to find its way down the spindle from the bearings above.

I re-weighed and plainly marked all the weights used for loading the instrument; as also the movable pulleys, which form part of the load.

I found that the load hitherto used, and which amounted on both pulleys to 16 lbs. 14 ozs., was not distributed on both sides as equally as was desirable; and I therefore re-adjusted the weights so that the pull on each pulley should be practically the same. To do this, I was obliged to increase the total load to 18 lbs. 5 ozs., which will necessitate making another scale for future anemograms, this, however, can be readily done.

I also instructed the observer, in the case of exceptionally heavy gales, to increase the gross load to 25 lbs. 8 ozs., in order to prevent the spindle from making a complete revolution, which would render the record useless. The extra load will not be used for moderate gales, and is to be removed as soon as the weather moderates.

With regard to the time-scale, I found that the reason why the hydraulic arrangement for lowering the cylinder could not be got to act less quickly (it now takes 20 minutes to run down) is because of leakage past the piston. This could be got over by re-packing; or it should be a very inexpensive matter to obtain from the clock a more open scale than that now in use, by adding another wheel and pinion to the present spindles, to lower the cylinder in six hours.

I took with me an arrangement, to fix to the arm of the instrument, to enable a pen to be used for the trace instead of a pencil. I found that the wire arm for carrying the pen had been made so long that it vibrated too much, when moved by the wind, to allow of a steady trace being obtained. I had not time to alter it myself, but I explained what was required, and Mr. Cotton undertook to see the alteration made, when I think it will act satisfactorily.

(Signed) R. H. CURTIS.

Reported—That Mr. Forbes, the observer at Stornoway, was about to retire, and that Mr. J. Mackenzie, Lloyd's agent at the place, had been appointed to succeed Mr. Forbes; the allowance to be 6*s.* per week.

Read—A memorandum from Mr. Baillie, stating that since last meeting 36 logs had been received, 14 of them being "excellent." Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Mr. Scott submitted the following returns for July 1 (Minutes, p. 7), and explained that the returns for October 1 would probably be ready by next meeting, at least as far as concerned the home stations:—

Place and Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office, April 18th, 1894, to July 1st, 1894.	Available	16	8	—	2	2	10
	Received, new	13	50	100	5	3	50
	„ repaired, cleaned, &c.	19	19	24	2	1	—
		48	77	124	9	6	60
	Issued	16	34	69	8	6	37
	Available	32	43	55	1	—	23
	Ordered	—	—	100	100	100	—
	Repairing	8	—	—	—	—	—
	Total available and ordered.	40	43	155	101	100	23

Place and Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Portsmouth, July 1st, 1894.	Establishment - -	23	53	150	50	50	25
	In Store - -	20	51	136	29	31	27
	Deficiency - -	3	2	14	21	19	—
Devonport, July 1st, 1894.	Establishment - -	22	50	140	45	45	22
	In Store - -	17	42	117	37	40	22
	Deficiency - -	5	8	23	8	5	—
Chatham, July 1st, 1894.	Establishment - -	18	54	120	35	35	25
	In Store -	17	48	93	2	6	21
	Deficiency - -	1	6	27	33	29	4
Sheerness, July 1st, 1894.	Establishment - -	6	22	40	15	15	6
	In Store - -	6	13	38	14	15	6
	Deficiency - -	—	9	2	1	—	—

(Signed) R. STRACHAN,
23rd July 1894.

Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
1894. July 1	Establishment at Meteorological Office	45	120	250	80	80	50
	In Stock - - - -	32	43	55	1	—	23
,,	Deficiency - - - -	13	77	195	79	80	27
,,	Deficiency at Portsmouth - -	3	2	14	21	19	—
,,	,, Devonport - -	5	8	23	8	5	—
,,	,, Chatham - -	1	6	27	33	29	4
,,	,, Sheerness - -	—	9	2	1	—	—
,,	Total deficiency. Home yards -	9	25	66	63	53	4
,,	Deficiency at Queenstown - -	—	—	—	3	3	—
,,	,, Gibraltar - -	—	—	—	—	—	—
,,	,, Malta - - -	3	—	33	—	—	—
,,	,, Bombay - -	—	—	—	1	1	—
,,	,, Halifax - -	1	—	6	—	—	1
	,, Bermuda - -	—	1	3	—	—	—
,,	,, Jamaica - -	—	—	—	2	2	1
,,	,, Cape Good Hope -	1	1	—	—	—	—
,,	,, Trincomalee - -	2	—	—	1	1	1
	,, Hong Kong - -	7	1	12	—	—	2
	,, Coquimbo - -	—	—	—	—	—	—
,,	,, Sydney - -	—	1	5	1	1	—
,,	,, Esquimalt - -	—	—	—	—	—	—
	Total deficiency. Dockyards abroad	14	4	59	8	8	5
	Total deficiency - - -	36	106	320	150	141	36
	Under repair and ordered - -	8	—	100	100	100	—
	Total required - - -	28	106	220	50	41	36

(Signed) R. STRACHAN,
20th August 1894.

Submitted—The following statement respecting the Records for July to December, 1893, received from the Self-recording Observatories (see Minutes, 21st December, 1868; 20th November, 1876; 3rd January, 1883; and 6th March, 1889):—

—	Aberdeen.		Armagh.		Falmouth.		Fort William.		Kew.		Valencia.	
ANEMOGRAPH:—	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.	Direction.	Velocity.
Action of Instrument -	Good.	Good.	Good.	Good.	Good.	Good.	—	—	Good.	Good.	Good.	Good.
Records deficient:—												
Due to stoppage of clock	0	0	74 hrs.	75 hrs.	0	0	—	—	5 hrs.	6 hrs.	0	0
„ other causes -	3 hrs.	3 hrs.	0	4	4 hrs.	17 hrs.	—	—	7 hrs.	7 hrs.	0	0
No. of errors discovered:—												
By general examination	0	0	9	9	2	3	—	—	1	1	4	0
Rslts. of 40 Remeasmnts.:—												
Greatest difference -	2·0	2·0	1·0	2·0	1·0	2·0	—	—	1·0	2·0	1·0	1·0
Mn. diff. irrespctv. of sign	0·2	0·4	0·1	0·3	0·1	0·4	—	—	0·2	0·3	0·1	0·3
Residual diff. (−M.O.) -	0·0	0·0	0·0	−0·1	0·0	+0·1	—	—	−0·1	−0·1	0·0	0·0
Orientation verified -	Monthly	—	Monthly	—	Monthly	—	—	—	Monthly	—	Monthly	—

—	Aberdeen.	Armagh.	Falmouth.	Fort William.	Kew.	Valencia.
RAIN-GAUGE:—						
Action of Instrument -	Good.	Good.	Good.	Fair to good.	Good.	Good.
Records deficient:—						
Due to stoppage of clock	0	0	0	33 hrs.	0	10 hrs.
„ other causes -	0	0	0	24 hrs.	3 hrs.	0
No. of errors discovered:—						
By general examination	0	0	3	14	8	0

—	Aberdeen.	Falmouth.	Fort William.	Kew.	Valencia.
BAROGRAPH:—					
Action of Instrument -	Good.	Good.	Good.	Good.	Good.
Character of Photography	Very good.	Excellent.	Do.	Do.	Fair to good.
Records deficient:—					
Due to stoppage of clock	0	0	0	0	0
„ failure of light -	0	2 hrs.	11 hrs.	3 hrs.	8 hrs.
„ other causes -	3 hrs.	9 hrs.	7 hrs.	6 hrs.	4 hrs.
No. of errors discovered:—					
In entry of standards -	0	0	12	0	0
„ calculating residuals -	3	2	7	0	0
„ applying „ -	1	1	27	0	2
„ maxima and minima -	0	2	3	0	2
By general examination -	0	2	95	1	25
Rslts. of 40 Remeasmnts.:—					
Greatest difference -	·006	·008	·007	·010	·006
Mn. diff. irrespctv. of sign	·002	·003	·002	·002	·002
Residual diff. (−M.O.) -	−·001	·000	·000	+·001	·000
Mean monthly diff. between simultaneous Bargph. and Stand. Bar. readings -	·002	·003	·002	·002	·002

—	Aberdeen.		Falmouth.		Fort William.		Kew.		Valencia.	
THERMOGRAPH:—										
Action of Instrument -	Good.		Good.		Good.		Good.		Good.	
Character of Photography	Fair to very good.		Do.		Fair to good.		Do.		Do.	
Records deficient:—	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.	Dry.	Wet.
Due to stoppage of clock	1 hr.	1 hr.	0	0	0	0	16 hrs.	16 hrs.	0	0
„ failure of light -	0	0	0	0	6 hrs.	13 hrs.	0	0	3 hrs.	3 hrs.
„ impfctly. moist. bulbs	—	7 hrs.	—	5 hrs.	—	9 hrs.	—	30 hrs.	—	4 hrs.
„ partlly. frozen bulbs	—	39 hrs.	—	14 hrs.	—	44 hrs.	—	39 hrs.	—	2 hrs.
„ other causes -	30 hrs.	28 d. 15 h.	16 hrs.	16 hrs.	7 hrs.	12 hrs	0	2 hrs.	5 hrs.	0
No. of errors discovered:—										
In entry of standards -	1	0	1	2	8	10	1	1	1	0
„ maxima and minima -	2	—	6	—	17	—	8	—	1	—
By general examination -	1	0	5	13	13	19	0	2	3	3
Rslts. of 40 Remeasmnts.:—										
Greatest difference -	0·2	0·2	0·2	0·2	0·3	0·4	0·1	0·2	0·2	0·2
Mn. diff. irrespctv. of sign	0·1	0·1	0·1	0·1	0·1	0·2	0·1	0·1	0·1	0·1
Residual diff. (− M.O.)	−0·1	0·0	0·0	0·0	+0·1	−0·1	0·0	0·0	+0·1	0·0
Mean monthly diff. between simultaneous Thrmgph. and Stand. Ther. readings	0·2	0·2	0·2	0·2	0·1	0·2	0·1	0·2	0·1	0·2

Aberdeen.

Anemograph.—The instrument was examined on September 5th, and the bearings were cleaned and oiled, and again oiled on November 25th. During damp weather the traces are faint.

Rain-gauge.—During July "the pipe touching check" caused faulty action on several days.

Barograph.—Trouble with the light shutter, which frequently failed to act, was experienced throughout the period. The instrument was examined to ascertain the cause on September 6th, when particular attention was given to the subject, but without success. During October there was occasionally a double edge to the lower part of trace.

Thermograph.—On July 1st the cylinder clamp slipped, and stopped the rotation of the cylinder from 4 a.m., to 10 a.m. 2nd. At 6.5 a.m. on August 8th, the wet-bulb thermometer was broken, and the trace was lost until 3.40 p.m. of September 4th, when a new tube was mounted. The zero-lines were changed from summer to winter positions on September 26th.

General.—The work done at this Observatory was very satisfactory, and the agreement between the readings of the respective standards and the record of the corresponding self-recording instruments is most marked.

Armagh.

Anemograph.—The velocity traces are intermittent at low rates. At 6.25 p.m. on November 21st the "spring of the catch must have given way, as the weight was found on the ground and the "end of the cord entangled on the axle of the barrel, as if the weight had run down violently;" put right on the following morning.

Rain-gauge.—Action satisfactory.

General.—The work was accurately done.

Falmouth.

Anemograph.—Instrument carefully attended to. On December 21st it was noticed that the action of the velocity apparatus was at times unsatisfactory, and on the 24th it was found that the adjustment of the velocity shaft and pencils' cylinder was defective.

Rain-gauge.—Instrument cleaned and examined on August 14th, and the working of the gauge was satisfactory throughout.

Barograph.—Instrument cleaned and examined on August 15th. The photography was of an exceptionally high standard, and the agreement between the readings of the standard barometer and the measurements of the traces (residuals) is very good. The clock face plate and dial was renewed in December.

Thermograph.—The instrument was cleared on August 15th. The records were satisfactory.

General.—The work at this Observatory during the period was very good.

Fort William.

Rain-gauge.—The differences between the daily rainfall by the Beckley gauge, as shown by the trace and measured in the glass, the latter value being generally larger than the former, causes the actual amount to be somewhat doubtful, and attention was again called to the subject in July. In the following month evidence of faulty action is apparent, and the totals by trace should not be quoted as the daily fall of rain. On September 14th and 15th the instrument was tested and repaired by Mr. Baker, the inspector from Kew, but in December the action was again unsatisfactory occasionally, the discharge being made at 0·130 instead of 0·180 (*see* curve 350, &c.), and this casts grave suspicion upon the hourly values. That the instrument was not always out of order is shown by the excellent trace on No. 337. Suggestions were made by me that the gauge should be removed to Kew for thorough examination.

Barograph.—The instrument was examined on September 13th. The action was satisfactory, but the traces suffered from the great variability of light consequent upon the use of oil lamps. This might be greatly reduced if there were a duplicate set of lamps, which should be changed regularly at 10.10 a.m. and p.m. The definition of the lower edge of trace was occasionally very indifferent.

Thermograph.—The instrument was cleaned on September 13th, and the zero-lines were changed from summer to winter positions on November 21st. Mr. Omond in November drew attention to the difficulty experienced with the wet bulb owing to the "strong northerly winds which caused very irregular coating of ice on bulbs."

General.—On more than one occasion during the period attention was drawn to errors in the work, which could hardly have been made had the regulations been acted upon.

Kew.

Anemograph.—On July 28th all parts of the instrument were cleaned, &c. The oil was found to be in good condition, but was replaced with asbestoline. In August the velocity traces were serrated during high rates, and this continued, although the cylinder was, on several occasions, geared more tightly with the clock, in order to minimise the effect of the oscillation of the direction. In

October the clock was dismounted and a new line was attached to the barrel and the working of the pricker was improved. The serration of the trace, nevertheless, continued, and in December the instrument was partially dismounted for the purpose of taking measurements for a new worm on fan spindle, improvement of the pricker, &c.

Rain-gauge.—The working of the gauge was satisfactory throughout, and the aniline ink trace on the Willesden paper surpasses any other form tried.

Barograph.—The beneficial effects of passing the light through a coloured glass (blue) is well shown on curves 186–7 and 190–1, in contrast to those given on 188–9, during which time the glass was removed and discolouration and bad definition ensued. On August 1st, the glass was again removed for several hours but replaced. The instrument was examined and cleaned on August 3rd, when the tube was slightly turned with the view of removing the blurring of lower edge of trace. The air-hole of the barograph was found to be clear in November. Towards the end of the period the increasing differences between the standard values and the measurements of the traces indicated that a change was taking place in some direction.

Thermograph.—Secondary images were at times prevalent with the wet bulb trace, and on July 31st the mirror was altered to improve the trace. The "dots" for zero-lines were raised on September 21st, and experiments were then made in order to shut out stray light. On October 30th, the lines were altered from the summer to winter positions.

General.—While the close agreement alluded to in connection with some of the observatories is not so noticeable at Kew, the work was generally good.

VALENCIA.

Anemograph.—The instrument was carefully attended to, and results were satisfactory.

Rain-gauge.—The gauge was dismounted, clock cleaned, and new lines attached on October 11th. A black lead pencil was substituted for the ink pencil on October 15th, the latter "running" too much when the paper became damp.

Barograph.—There is a double edge to the lower part of the trace occasionally. On the 3rd October a new wick was fitted to the lamp, and subsequently the lower edge of trace was blurred and indistinct.

Thermograph.—The variability of the breadth of the traces (amounting to 0°·6 on the same curve) was again pointed out, and the suggestion made with regard to the lamps at Fort William apply also to this station. The zero-lines were changed from the summer to the winter positions on October 2nd.

General.—Attention was called to some errors made in tabulating, and repeated in the "B" column of the subsidiary, supposed to be an entirely independent measurement.

(Signed) T. E. ALLEN.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council—an interval of three months :—

1. WARNINGS ISSUED.

A + B (successful) - - - -	= 12 districts.
C (failures) - - - - -	= 5 „

2. GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,
17th October 1894.

Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 10th July - - - -	4,527	16	1
Receipts from 11th July to 16th October -	3,663	8	8
	8,191	4	9
Cheques drawn from 11thJuly to 16th October	3,615	12	4
Balance on 16th October - - -	£4,575	12	5

Reported—That F. E. Dash had left the Office on July 31st, having passed into the Civil Service, and that Harold Brown had been appointed in his stead, at 14*s.* per week. (Letter 1607.)

Reported—That Mr. J. S. Harding, Senr., formerly Office keeper, and in receipt of a pension, had died August 7th.

Submitted—The following report on the Forecasts issued at 8.30 p.m. daily during the month of July 1894:—

The letters used have the following signification:—

a = complete success. | **c** = partial failure.
b = partial (*i.e.*, more than half) success. | **d** = total failure.

JULY.

Districts.		Per-centages. Wind.	Weather.	Average Forecast.	Per-centage of Success. a + b.
Scotland, N.	a	65	68	67	84
,,	b	22	13	17	
,,	c	10	6	8	
,,	d	3	13	8	
Scotland, E.	a	87	55	71	87
,,	b	0	32	16	
,,	c	13	7	10	
,,	d	0	6	3	
England, N.E.	a	61	61	61	87
,,	b	26	26	26	
,,	c	10	10	10	
,,	d	3	3	3	
England, E.	a	71	58	65	83
,,	b	16	20	18	
,,	c	3	19	11	
,,	d	10	3	6	
Midland Counties	a	61	55	58	76
,,	b	29	6	18	
,,	c	3	26	14	
,,	d	7	13	10	
England, S.	a	61	52	57	76
,,	b	23	16	19	
,,	c	3	19	11	
,,	d	13	13	13	
Scotland, W.	a	61	55	58	90
,,	b	32	32	32	
,,	c	7	7	7	
,,	d	0	6	3	
England, N.W.	a	39	55	47	81
,,	b	42	26	34	
,,	c	13	13	13	
,,	d	6	6	6	
England, S.W.	a	32	52	42	76
,,	b	42	26	34	
,,	c	13	19	16	
,,	d	13	3	8	
Ireland, N.	a	42	68	55	86
,,	b	39	23	31	
,,	c	6	3	5	
,,	d	13	6	9	
Ireland, S.	a	26	65	46	81
,,	b	42	29	35	
,,	c	16	3	10	
,,	d	16	3	9	
SUMMARY.					
British Isles	a	55	58	57	82
,,	b	28	23	25	
,,	c	9	12	11	
,,	d	8	7	7	

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of August 1894:—

The letters used have the following signification :—

a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

AUGUST.

Districts.		Per-centages. Wind.	Weather.	Average Forecast.	Per-centage of Success. a + b.
Scotland, N.	a	68	77	73	90
,,	b	22	13	17	
,,	c	10	10	10	
,,	d	0	0	0	
Scotland, E.	a	58	65	62	87
,,	b	19	32	25	
,,	c	23	3	13	
,,	d	0	0	0	
England, N.E.	a	68	61	65	87
,,	b	19	26	22	
,,	c	13	7	10	
,,	d	0	6	3	
England, E.	a	71	61	66	92
,,	b	26	26	26	
,,	c	3	3	3	
,,	d	0	10	5	
Midland Counties	a	65	58	62	89
,,	b	29	26	27	
,,	c	6	10	8	
,,	d	0	6	3	
England, S.	a	68	61	65	87
,,	b	26	19	22	
,,	c	6	10	8	
,,	d	0	10	5	
Scotland, W.	a	49	55	52	86
,,	b	35	32	34	
,,	c	16	7	11	
,,	d	0	6	3	
England, N.W.	a	48	68	58	89
,,	b	39	23	31	
,,	c	13	0	7	
,,	d	0	9	4	
England, S.W.	a	58	84	71	92
,,	b	29	13	21	
,,	c	10	3	7	
,,	d	3	0	1	
Ireland, N.	a	58	61	60	84
,,	b	29	20	24	
,,	c	13	3	8	
,,	d	0	16	8	
Ireland, S.	a	68	58	63	89
,,	b	23	29	26	
,,	c	9	7	8	
,,	d	0	6	3	
Summary.					
British Isles	a	62	64	63	89
,,	b	27	24	26	
,,	c	11	6	8	
,,	d	0	6	3	

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of September 1894 :—

The letters used have the following signification :—

a=complete success. | c=partial failure.
b=partial (*i.e.*, more than half) success. | d=total failure.

SEPTEMBER.

Districts.		Per-centages.			Per-centage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	60	64	62	82
,,	b	27	13	20	
,,	c	10	13	12	
,,	d	3	10	6	
Scotland, E.	a	63	54	59	85
,,	b	20	33	26	
,,	c	17	13	15	
,,	d	0	0	0	
England, N.E.	a	60	50	55	90
,,	b	30	40	35	
,,	c	10	10	10	
,,	d	0	0	0	
England, E.	a	67	57	62	87
,,	b	20	30	25	
,,	c	13	10	12	
,,	d	0	3	1	
Midland Counties	a	53	63	58	85
,,	b	27	27	27	
,,	c	20	10	15	
,,	d	0	0	0	
England, S.	a	64	60	62	90
,,	b	23	33	28	
,,	c	13	7	10	
,,	d	0	0	0	
Scotland, W.	a	57	53	55	80
,,	b	23	27	25	
,,	c	17	17	17	
,,	d	3	3	3	
England, N.W.	a	70	67	69	89
,,	b	23	17	20	
,,	c	7	16	11	
,,	d	0	0	0	
England, S.W.	a	70	70	70	87
,,	b	13	20	17	
,,	c	10	7	8	
,,	d	7	3	5	
Ireland, N.	a	80	70	75	89
,,	b	4	23	14	
,,	c	13	7	10	
,,	d	3	0	1	
Ireland, S.	a	57	60	59	84
,,	b	30	20	25	
,,	c	13	17	15	
,,	d	0	3	1	

SUMMARY.

British Isles	a	64	61	63	87
,,	b	22	26	24	
,,	c	13	11	12	
,,	d	1	2	1	

Submitted—The following reports of work during the three months to September 30th, 1894:—

MARINE BRANCH.

October 16, 1894.

Examined 30 new logs and 5 lighthouse registers.

Discussing the fog frequency and preparing monthly wind and current charts for the district between the Cape of Good Hope and New Zealand.

Mean wet-bulb values added to the Red Sea charts, and the whole of the wind and current charts passed for press.

Steady progress made with the preparation and extraction of data for the area south of the equator between longitudes 10° E. and 90° W.

Ocean currents contained in lately received office logs added to the charts.

Proof of a new issue of the Rough Book for the use of captains passed for press.

Mr. F. Dash resigned on July 31st, having obtained a Civil Service appointment.

Mr. H. Brown appointed to the branch on September 3rd.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.

(To 30th September 1894.)

Weekly Weather Report, 1894. All numbers issued to date.

Appendix I.—Part 2 issued, Part 3 well in hand. Monthly summaries—all issued to July; that for August is in printer's hands.

Daily Weather Report.—All numbers issued promptly to date.

Primary checking of Storm Warnings, 1894.—Done to date.

Checking of (8.30 *p.m.*) *Daily Forecasts.*—Done to date.

Hay Harvest Forecasts.
Forecasts for several Subscribers. } Done.
Forecasts for Board of Agriculture.

Rainfall Publication.—First six sheets carefully revised and now ready "for press," but little else done owing to incidence of Summer Vacations.

Inspections.—Notes prepared for all parts of the British Islands and sent to inspectors. The stations in S. and E. of England duly inspected by myself.

During this period nearly all the staff have taken their annual leave.

(Signed) FREDC. GASTER.

Telegraphic Branch,
17th October 1894.

PANTAGRAPH ROOM.

October 1, 1894.

Hourly Means.

The proof sheets of the volume of "Hourly Means" for 1891 are being revised as they are received from the printer. The preparation of the various tables of means for 1892 is still in hand, and about one-half of the work is now complete.

Miscellaneous.

The routine work of the room has been kept up to date. Six months sunshine cards from Bunhill Row have been tabulated for the Royal Meteorological Society. The greater part of the summer vacation has been taken by the staff during the period covered by this report.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

October 16, 1894.

Examinations.

September–December, 1893.—Completed.
January–June, 1894.—Proceeded with.
April–September, 1894.—Valencia work completed.
Weekly examination (on receipt) of curves and documents from all Observatories.

Reports.

August–December, 1893.—Copies of "Notes of Errors" to Aberdeen, Armagh, Falmouth, and Fort William.
April–September, 1894.—Copies of "Notes of Errors" to Valencia.
July–December, 1893.—Tabular reports for each month and combined report for Council.

Miscellaneous.

Diurnal Range of Rainfall, 1871–80.—Examination and correction of the hourly values, &c., proceeded with.

Examining and cutting rain-gauge forms for printers.

General routine work, and annual vacation has been taken by the staff since the date of last report.

(Signed) T. E. ALLEN.

Submitted—The following statement of accounts for the six months ending 30th September 1894 :—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1893–94	- - -	1,517 12 11	Administration :		
Proportion of vote	- - -	7,000 0 0	Secretary	400 0 0	
Repayment of expenses charged under—			Salaries and wages	447 13 3	
(1.) Incidental expenses	1 6 1		Rent, fuel, and lighting	359 0 1	
(2.) Observatories	21 10 3		Furniture and fittings	14 17 0	
		22 16 4	Incidental and contingent expenses	102 18 0	
			Pensions	82 14 1	
Supply of Weather Information :					1,407 2
D.W. Charts and Forecasts	141 18 4		Special Researches :		
6 p.m. Charts	12 10 0		Salaries and other charges	- - -	394 17
Information for Press Agencies, &c.	45 9 10		Land Meteorology :		
Telegrams	60 13 1		Observatories and stations	1,078 10 0	
		260 11 3	Discussion and reduction of observations	797 9 0	
					1,875 19
Sale of Instruments, &c. :			Weather Information and Forecasts :		
"M.O." account	13 5 11		Telegraphic reports and storm warnings	1,189 9 1	
Royal Navy account	2 9 11		Preparation and issue of reports and forecasts	930 0 8	
Mercantile Marine account	0 12 0				2,119 9
		16 7 10	Inspections :		
Miscellaneous Commissions	- - -	16 9 0	Salaries and travelling	- - -	31 14
Commission charged on work done for Colonies, &c.	- - -	2 4 10	Ocean Meteorology :		
			Discussion and reduction of observations	796 4 0	
			Expenses incidental to the supply of instruments :		
			Proportion for care and issue of instruments	100 0 0	
			Royal Navy	577 0 9	
			Mercantile Marine	91 10 2	
			Distant island and coast stations	5 0 0	
					1,569 14 1
			Miscellaneous Commissions	- - -	33 5
			Balance :—		
			Cash at bank	1,224 17 11	
			„ at Office	64 0 11	
			Advances for travelling expenses	115 0 0	
					1,403 18 1
		£8,836 2 2			£8,836 2 2

Liabilities.	£ s. d.	Assets.	£ s. d.
To Council	500 0 0	By H.M. Exchequer	650 0 0
„ Post Office (partly estimated)	259 16 0	„ cash at Bank	1,224 17 1
„ sundry creditors	*616 4 10	„ „ at Office	64 0 1
„ balance	749 11 2	„ sundry debtors	186 13 1
	£2,125 12 0		£2,125 12 0

* Some expenses for travelling, Office repairs, and observations not brought to account.

Read—Applications for exchange of publications from the Magnetical and Meteorological Observatory, Potsdam (Letter 1825), and from the central Meteorological Office of Bulgaria, at Sofia. (Letter 1729.) Granted.

Reported—That the cash accounts for the quarter ended the 30th June 1894, had been audited on the 21st July by the Chairman and Mr. Galton, and had been sent to the Treasury for the Audit Office. The receipts for the quarter amounted to 3,668*l.* 8*s.* 9*d.*, the payments amounted to 4,080*l.* 19*s.* 10*d.*, leaving a balance of 1,105*l.* 1*s.* 10*d.* in hand, and at the bank, on the 1st July 1894, as against 1,517*l.* 12*s.* 11*d.* on the 1st April last.

Submitted—The following list of publications which had been received since the last meeting :—

Aitken, James.—Meteorological table for the years 1887–89 ; 1891–93. Compiled from observations taken at Braemar, Aberdeenshire.

Albany, State Meteorological Bureau and Weather Service.—Annual report of the Commissioners. 3rd and 4th. 1891, 1892.

Allahabad, Meteorological Office.—Brief sketch of the meteorology of the North-Western Provinces, Oudh, and Eastern Rajputana, 1886.

Barnes, R. H.—Some remarks on 1893.

Bebber, W. J. van.—Häufigkeit und Tiefe der barometrischen Minima sowie Bahnen der Maxima und stationäre Maxima in dem Zeitraum vom Winter 1883–84, bis Ende Herbst 1887.

Bezold, W. von.—Ueber Wolkenbildung.

Calcutta, Meteorological Office.—Brief sketch of the meteorology of the North-Western Provinces and Oudh, and adjacent parts of Rajputana and the Punjab. 1890, 1893.

—— —— Memorandum on the snowfall in the mountain districts bordering Northern India, and the abnormal features of the weather in India during the past five months, with a forecast of the probable character of the south-west monsoon rains of 1894.

—— —— *Bengal.*—Summary of the meteorology of Bengal for 1893.

—— *Surveyor General of India.*—General report on the operations of the Survey of India Department during 1892-93.

Carlsruhe, Centralbureau für Meteorologie und Hydrographie.—Die Ergebnisse der meteorologischen Beobachtungen im Jahre, 1893.

—— —— Jahresbericht . . . für den Jahren, 1887–1891 und 1893.

—— —— Niederschlags-beobachtungen der meteorologischen Stationen im Grossherzogthum Baden. 1889, 1 Halb. ; 1893, 1–2 Halb.

Chemnitz, K. Sächsisches Meteorologisches Institut.—Ergebnisse der meteorologischen Beobachtungen im Jahre, 1893.

Christiana, Norsk Meteorologisk Institut.—Oversigt over Luftens Temperatur og Nedbøren i Norge i Aaret, 1893.

Colombo, Surveyor-General's Office.—Report on the meteorology of Ceylon for 1893.

Copenhagen, Dansk Meteorologisk Institut.—Meteorologisk Aarbog for 1893. Del. i., iii.

Cracow, C. K. Akademii Umiejetnosci w Krakowie.—Materyaly do Klimatografii Galicyi. 1893.

Croydon, Microscopical and Natural History Club.—Report of the meteorological sub-committee for 1893.

Emden, Naturforschende Gesellschaft.—Jahresbericht. 1892–93.

Frankfurt am Main, Physikalischer Verein.—Jahresbericht . . . für das Rechnungsjahr 1892-93.

Greenwich, Royal Observatory.—Results of the magnetical and meteorological observations made at the Royal Observatory, Greenwich, in the year 1891.

Grossmann, L.—Ueber die Anwendung der Bessel'schen Formel in der Meteorologie.

Hamburg, Deutsche Seewarte.—Resultate meteorologischer Beobachtungen von Deutschen und Holländischen Schiffen für Eingradfelder des Nordatlantischen Ozeans. Quadrat 114. No. XIII.

Hann, J.—Die tägliche Periode der Windstärke auf dem Sonnblickgipfel und auf Berggipfeln überhaupt.

Helsingfors, Institut Météorologique Central.—Observations. Vols. III.–V. 1884–86.

Hobart, Royal Society of Tasmania.—Papers and proceedings, 1893.

Hong-Kong Observatory.—Observations and researches. 1893.

Irkutsk, Observatorium.—Die Beobachtungen des meteorologischen und magnetischen Observatoriums in Irkutsk. 1890-92.

Jenkins, B. G.—Tellustria : a method for determining astronomically the variations in the temperature and pressure of the atmosphere. With chart showing forecast readings for 1894, and actual readings to date.

Klossovsky, A.—Distribution annuelle des orages à la surface du globe terrestre.

—— Organisation de l'étude climatérique spéciale de la Russie et problèmes de la météorologie agricole.

Lahore, Sanitary Commissioner.—Report on the sanitary administration of the Punjab for the year 1893.

Liverpool Observatory.—Extracts from the report of the Director of the Observatory to the Marine Committee, and meteorological results deduced from observations taken . . . during the years 1892 and 1893.

London, Admiralty, Hydrographic Office.—North Sea Pilot. Part i. Fourth edition.
—— —— —— The China Sea Directory. Vol. III. Third edition.
—— —— —— The St. Lawrence Pilot. Vol. I. Sixth edition.
—— —— —— The Mediterranean Pilot. Vol. I. Third edition.
—— —— —— Tide-tables for the British and Irish ports, for the year 1895.
London, Meteorological Office.—A barometer manual for the use of seamen. Second edition.
Marriott, W.—Moisture, its determination and measurement.
—— Thunder and hail storms over England and the south of Scotland, July 8th, 1893.
—— Comparative observations with two sets of instruments at Ilfracombe, North Devon, during 1893.
Magdeburg.—Jahrbuch der meteorologischen Beobachtungen der Wetterwarte der Magdeburgischen Zeitung. Bd. XI. Jahrg. xii. 1892.
Margate, Medical Officer of Health.—Annual report for 1893, to which is appended the meteorological report.
Mauritius, Royal Alfred Observatory.—Results of meteorological observations taken during the year 1893.
Mysore Government Meteorological Department.—Report on rainfall registration in Mysore for 1893; by John Cook.
Odessa, Observatoire Météorologique de l'Université.—Revue météorologique. Travaux du réseau météorologique du sud-ouest de la Russie. Vol. VI. 1893.
Paulsen, A.—Sur la nature et l'origine de l'aurore boréale.
Peek, C. E.—Meteorological observations for the year 1893 at Rousdon Observatory. Vol. X.
Peking, Inspectorate-General of Customs.—Medical reports for the half-year ended 31st March 1891. Forty-first issue.
Plymouth.—First annual meteorological report; by H. V. Prigg. 1893.
Prague, K. K. Sternwarte.—Magnetische und meteorologische Beobachtungen. 1893.
Puebla.—Observaciones meteorológicas del Colegio Catolico del Sagrado Corazon de Jesus en Puebla. 1879.
—— Resumen de las observaciones meteorológicas practicadas en el Colegio Catolico del Sagrado Corazon de Jesus en Puebla. 1887–1889.
Rome, Ufficio Centrale Meteorologico e Geodinamico Italiano.—Annali. xii., 1890, Parte i.; xiv., 1892, Parte I.; xv., 1893, Parte I.
São Paulo, Commissão Geographica e Geologica.—Dados climatologicos. 1890–1892. Por A. Loefgren.
Schreiber, P.—Die Zustandsgleichungen einer Luftsäule. Barometrische Höhenformel. Zweite Mittheilung.
Scott, R. H.—Barometrical conditions and air movements.
Singapore, Principal Civil Medical Officer.—Annual meteorological report, Straits Settlements, for 1893.
Sohncke, L.—Gewitterstudien auf Grund von Ballonfahrten.
Southport, Fernley Observatory.—Report, and results of observations, for the year 1893.
Stelling, E.—Magnetische Beobachtungen im Ostsibirischen Küstengebiete im Jahre 1890 nebst Bemerkungen über die Anderungen der erdmagnetischen Elemente daselbst.
Sterneck, R. von.—Die Polhöhe und ihre Schwankungen, beobachtet auf der Sternwarte des k. und k. militär-geographischen Institutes zu Wien.
—— Relative Schwerebestimmungen ausgeführt im Jahre 1893.
Stockholm, Kongl. Svenska Vetenskaps-Akademie.—Meteorologiska Iakttagelser i Sverige. Bd. 32. 1890.
Straits Settlements.—Annual report on the State of Selangor for 1893.
—— —— Annual report of the State of Negri Sembilan for 1893.
Strassburg, Meteorologischer Landesdienst.—Ergebnisse der meteorologischen Beobachtungen im Reichsland Elsass Lothringen im Jahre 1892.
Sydney, Royal Society of New South Wales.—Journal and proceedings for 1893. Vol. xxvii.
Symons, G. J. and Wallis, H. S.—British rainfall, 1893
Tokio, Central Meteorological Observatory.—Storm signal stations in Japan. 1894.
Tyrer, R.—The meteorology of Cheltenham. 1892, 1893.
Veeder, M. A.—Solar electrical energy not transmitted by radiation.
Ward, R. De C.—List of cloud photographs and lantern slides.
Washington, Department of Agriculture, Weather Bureau.—Protection from lightning; by A. McAdie.
—— —— —— Summary of international meteorological observations; by H. H. C. Dunwoody.
Wilson, W. E.—The thermal radiation from sun spots.
Wilson, W. E. and Gray, P. L.—Experimental investigations on the effective temperature of the sun, made at Daramona, Streete, Co. Westmeath.
Wilson, W. R.—Abstract of meteorological observations made at Ladylaw, Hawick, during 1893.
Wollny, E.—Untersuchungen über das Verhalten der atmosphärischen Niederschläge zur Pflanze und zum Boden.

63, *Victoria Street, October* 31, 1894.

PRESENT:

MR. GALTON IN THE CHAIR.

PROFESSOR DARWIN. | MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (October 17) were read and confirmed.

The subject of the title of the new rain tables for the United Kingdom was discussed, and it was decided that it should be the same as that of the older work, of which it is a continuation.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council:—

WARNINGS ISSUED.

A + B (successful) - - - -	=	34 districts.
C (failures) - - - - -	=	7 districts.

GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,
31st October 1894.

Read—A memorandum stating that since last meeting, seven logs had been received, six of them being "excellent."

Mr. Scott was instructed to present the charts (O. 92) to Captain Thomas, and (O. 90) to Captain Darby, and to convey the best thanks of the Council to the other observers.

Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 16th October - - -	4,575	12	5
Receipts from 17th to 30th October - -	14	8	0
	4,590	0	5
Cheques drawn from 17th to 30th October -	348	16	0
Balance on 30th October - - - -	£4,241	4	5

Submitted—Reports on the records hitherto received from St. Helena (Minutes, p. 29), stating *inter alia* that the anemometer sheets for September 1894 showed considerable improvement on the earlier ones.

Mr. Scott was instructed to thank Mr. Hands for his care of the instruments, and to express the hope that they would be found to work well in future (P.C. 1962).

(M.O. 1859.)

Kew Observatory, Richmond, Surrey,
October 16th, 1894.

DEAR MR. SCOTT,

I BEG to forward you the reports by Mr. Constable and myself on the observatories and anemometer stations we have inspected, with list of expenses, &c.

I am, &c.
(Signed) CHARLES CHREE.

(M.O. 1859.)

REPORT on INSPECTION of OBSERVATORIES for METEOROLOGICAL COUNCIL, August 1894.

Aberdeen Observatory, visited August 14th and 15th.—The anemometer has been recently painted. It was dismounted, cleaned, and freshly lubricated. The sheet showing results of orientation is attached. The barograph and thermograph clocks were oiled; they appeared clean,

and were working satisfactorily. The surface of the mercury in the standard barometer is a little dirty, but Mr. Boswell does not find this interfere with his readings. The thermograph screen has been protected with wire netting, according to recent instructions from the Meteorological Office. By comparison with my Kew standard in water at 60½°, the following corrections were found for the thermometers:—

	Correction.
Dry standard, 597	−0°·1
Wet „ 395	−0·7
Maximum, 1002	+0·1
Minimum, 5056	+0·3

The tube from the funnel to the receiver of the Beckley rain-gauge was in a somewhat patched condition; it was however intended, I was told, to fit a new tube shortly. Otherwise the instrument appeared in a satisfactory condition.

Glasgow Observatory, visited August 16th.—The anemometer was shifted in spring on to an iron framework, a little to the east of the dome, the cups being now some 3½ feet higher above the ground than previously. The instrument had been thoroughly seen to before its re-erection, and as the lubricant appeared in good condition, I judged it unnecessary to dismount it. The sheet with the results of the orientation is attached. Advantage was taken of the presence in the observatory of an experienced clockmaker to have the anemograph, barograph, and thermograph clocks all thoroughly cleaned. The threads and muslins to the wet bulb, though apparently but a short time in use, were somewhat dirty, so I called the assistant's attention to the point, and had fresh ones fitted. A comparison with my Kew standard in water at 56½°, gave the following corrections to the thermometers:—

	Correction.
Dry standard, 708	0°·0
Wet „ 711	+0·1
Maximum, 45904	+0·1
Minimum, 63942	+0·1

The Beckley rain-gauge appeared in good order. The assistant, however, pointed out that discharge occurred when by the trace considerably less than 0·2 inch rain had fallen. This appeared due to the pencil pressing too heavily on the paper, as on reducing the pressure fair results were obtained.

Kew Observatory.—All the self-recording instruments have been cleaned and attended to as usual.

(Signed) CHARLES CHREE.

(M.O. 1859.)

REPORT on INSPECTION of OBSERVATORIES and ANEMOGRAPH STATIONS for the METEOROLOGICAL COUNCIL, July–August 1894.

Alnwick Castle, visited July 30th and August 1st.—The anemometer is kept well oiled, and an examination of the bevelled wheels and bearings of the shafting showed that their lubrication was properly attended to.

I found that a blade of one of the direction-fans was broken off at the collar. This quite destroyed the balance of the fan, and made the action very sluggish.

It had been proposed to have it removed from the spindle and sent to the maker to be put in proper order, and advantage was taken of my visit to dismount it for this purpose. The exposure of the instrument is very good, except from the N.E., where the wall at that angle of the tower rises above the other portions, and in high winds from that quarter must cause strong eddies and sudden oscillations in the direction.

Verification of the orientation is difficult owing to the very large amount of shafting employed, but I returned again on August 1st, and further improved the general working of the instrument, and the orientation is now fairly good.

The advantage of having the exact times of changing entered on the sheets was pointed out, and it was readily agreed that these entries should be made on future curves.

North Shields, visited July 31st.—All exterior parts of the instrument which can be readily reached are kept carefully oiled, but owing to its position surmounting chimneys on the lighthouse it soon becomes covered with soot, &c., and I took the opportunity of obtaining regular assistance here, to entirely dismount and thoroughly overhaul every part, both exterior and interior.

The orientation was checked and found good, and the check marks will be found on the anemograph curve for July 31st–August 1st, which was sent to the Meteorological Office next day.

Captain Harrison was instructed to check the orientation regularly, and to duly forward the oriented sheets.

Yarmouth, visited August 3rd.—The anemometer appears to be systematically lubricated and attended to, and was in good order. All necessary cleaning, &c. was done, the orientation was

found to be satisfactory, and the check lines will be found on the anemograph curve for August 3rd–4th.

This sheet also shows three curves of complete revolutions of the velocity spiral, made after taking down the recording part, and improving the irregular marking which often occurs here.

Considerable time was given to this, and the action is now much better, but I am afraid there will always be a tendency to a recurrence of this uneven marking of the velocity trace. I drew attention to the absence of "pricker" marks, but to make these distinct with the present pricker is difficult, as it is an old type made of soft steel, and the long arm bends over if much pressure is used, but I made it as firm as possible, and improved the point.

Falmouth, visited August 8th–10h.—The barograph and thermograph were in good order, but the clock escapements of both instruments required cleaning and fresh oiling, which was done, and all lenses carefully wiped.

The dials of both of these clocks have been re-plated since my last inspection, and are very much improved.

The "air-hole" of barograph was found quite clear.

Anemograph.—All exterior parts are kept well lubricated where possible, but I found the oil in the container in which the direction rollers work was rather thick and dirty. The whole was removed, rollers, &c. washed in paraffin, and the container filled up with new asbestos lubricant.

All other parts were thoroughly overhauled, and clock, &c. cleaned.

The orientation was checked and found good and the check-sheet accompanies this report.

The Beckley rain-gauge was also dismounted and cleaned.

The tops of some of the wooden stakes securing the check rain-gauge were found to have perished, these were replaced, and gauge carefully levelled.

A "squeeze" of this gauge is forwarded herewith.

The scale-values at present in use are:—

Dry bulb upper zero	82°·5	Lower zero	16°·5
Wet „ „ „	81·0	„ „	18·0

and the values engraved on the ivory scales are:—

Barograph, 1 inch	=1·525 inches.
Thermograph, dry-bulb, 10°	=0·734 „
„ wet „	No value given.

The thermometers were compared with my Kew standard at 62°, and the following corrections determined:—

Dry-bulb, 383	= −0°·55
Wet „ 388	= −0·30
Maximum, M.O. 104	= −0·40
Minimum, M.O. 308	= −0·00

Radcliffe Observatory, Oxford, visited August 30th.—I examined the various self-recording meteorological instruments and clocks, and found everything in first-class order. The working of the exterior portions of the anemograph was also examined and proved very satisfactory.

The following corrections to the thermometers in use were determined by comparison with my standard at 60° F.

Thermograph, wet-bulb standard, 575	= −0°·15
„ dry „ „ 576	= −0·10
Wet-bulb thermometer, B.T. 1709	= −0·20
Dry „ „ „ 1710	= −0·20
Maximum „ M.O. 356	= −0·30
Minimum „ „ 363	= +0·10
Grass minimum „ 70852	= 0·00

(Signed) E. G. CONSTABLE.

(M.O. 193f.)

Kew Observatory, October 27, 1894.

DEAR SIR,

I HAVE the honour to submit herewith my Report to the Meteorological Council regarding their self-recording instruments at the observatories and anemograph stations inspected on the days named.

Stonyhurst, September 18th–19th.—Since the last inspection (September 25th–26th, 1893) the anemometer at this observatory has been re-fitted with new recording apparatus. My attention, however, was called by the Reverend W. Sidgreaves to the direction trace, which was not altogether satisfactory, being at times very faint. I accordingly dismounted the pencil, and found that the spindle upon which it turned was gritty and the oil rather thick, this was cleaned, and afterwards the action of the pencil was much improved.

The external parts of the instrument were examined and found to be well lubricated, and in every way satisfactory.

The orientation was duly examined, and the sheet containing the result accompanies this report.

Both the barograph and thermograph clocks were taken to pieces and cleaned, and new cords attached to the weights.

The clock dials having become tarnished through age, it was difficult to distinguish either the figures or graduations, and in consequence the observer experienced considerable difficulty in correctly setting the hand to time. Advantage was taken of the instruments being dismounted to remove the dials and send them to Mr. Munro for re-silvering.

Wire netting has been fitted to the thermograph screen in accordance with the instructions issued by the Council.

The rain-gauge was dismounted, and the new Stonyhurst lifter (which had recently been supplied by the Meteorological Office) fitted and adjusted to the instrument, the clock was also cleaned and a new line attached to the weight.

Squeezes of both the self-recording and check rain-gauge funnels were taken, and are forwarded herewith.

The various thermometers were compared with the Kew Standard No. 682, and found to have the following correction at 55° Faht.

Dry bulb standard, No. 619	0°·0
Wet „ „ No. 382	−0·3
Maximum, 1525	0·0
Minimum, B.T., 501	+0·3

I also tested the maximum and minimum thermometers on the Glaisher stand, and found the corrections to be—

Maximum, 7310	−0°·5
Minimum, 48587	−0·1

Fleetwood, September 20th–21st.—Here the anemometer was working well, and on dismounting the external parts the oil was found in a satisfactory state; all parts of the instrument were cleaned, and the bearings replenished with fresh asbestos lubricant.

On examining the direction fans, two of the blades were discovered to be loose, but these I had re-soldered before leaving. The cup arms and stays did not show any signs of wear.

The clock was taken to pieces and cleaned, and the direction pencil also carefully examined and adjusted in order to remedy, if possible, the failure of the pencil in marking continuously. Some difficulty was experienced by the observer in clamping the cylinder, which would account for the differences shown between the curves and the times noted of starting the instrument. I had an extra washer fitted to the clamp, so that the cylinder does not now slip, and at the same time a new pin was fitted to the driving wheel on the clock spindle.

On the 25th of March last, a flagstaff about 95 feet in height was erected by the Town Commissioners on the "Mount," some 30 feet to the E.N.E. of the anemograph, but as the halyards are at least 25 feet above the cups, I do not think that the results will be materially affected when the wind is blowing from that direction.

The orientation was duly examined and found correct, and Mr. Gaulter was asked to forward from time to time an "Orientation" paper to the Meteorological Office.

Fort William, September 24th–25th.—All the instruments at this observatory were in good order.

The barograph and thermograph clocks were cleaned, as well as the lenses and condensers, and new lines fitted to the weights. Some little difficulty was experienced in adjusting the thermograph light stop, but by adding an additional weight to the lever its action was much improved, and it has since worked satisfactorily.

The rain-gauge was examined, but as it had only quite recently been put together by Mr. Omond the clock did not require cleaning.

In order to slightly extend the range of the float a little mercury was added to the cistern, and the pencil re-adjusted.

Squeezes of both the self-recording and check rain-gauge funnels were taken, and are sent herewith.

The following were found to be the corrections to the various thermometers in use at 55° Faht.:—

Dry bulb standard, 671	0°·0
Wet „ „ 672	−0·2
Maximum 1092	+0·1
Minimum 1322	+0·8
Barograph thermometer K.O. 6–90	−2·1
Attached thermometer (to the standard barometer) No. 72222	−0·2

As the minimum thermometer read suspiciously low it was taken off the scale, and the chamber warmed by means of a lamp. It was then placed in a vertical position for some two hours, when the following correction was determined:—

Minimum No. 1322	+0°·4

Deerness, Orkney, September 28th–29th.—The anemograph here was found to be maintained in excellent order, the bearings of all parts being well oiled and in good condition.

Mr. Spence reported that the external parts of the anemograph as well as the hut had been recently painted.

I had the instrument dismounted and carefully examined the cup, arms, and fans, but these did not show any marked signs of wear. Two oil screws, however, are missing.

After cleaning and replenishing the bearings with fresh asbestos lubricant the orientation was examined, and the observer was instructed to orientate the instrument once a month and forward the results to the Meteorological Office.

The clock was also cleaned and the whole of the recording apparatus dismounted and attended to.

Armagh, October 5th–6th.—At this observatory the anemograph was much in need of cleaning, as it had not been dismounted since the spring of 1892.

All the external portions of the instrument were taken to pieces and the thick oil removed, after which asbestos lubricant was supplied to all the bearings. The recording pencils were also examined and cleaned, and endeavours were made to improve the action of the velocity pencil, which does not mark satisfactorily in light winds, but I fear the defect is inherent in the instrument The clock having comparatively recently been cleaned it only required oiling, but Dr. Dreyer stated that it occasionally stopped. On examination, I found that it had been geared up too tightly to the recording cylinder, this was put right.

The orientation was tested and found correct, and the sheet is sent with this Report.

The rain-gauge was entirely dismounted, the clock taken to pieces and cleaned, and a new cord attached to the weight.

Squeezes of both the self-recording and check rain-gauge funnels were made, and are forwarded herewith.

Mountjoy Barracks, Dublin, October 8th–9th.—The lubrication of the external parts of the anemograph was not satisfactory, the instrument not having been dismounted since March 1892 the oil had become viscous and the friction balls much impeded, so that all parts had to be taken to pieces and well cleaned with paraffin.

The box containing the oil dampers, to which the direction shaft is geared, was also taken to pieces and the reservoir filled with asbestos lubricant, afterwards the apertures at the ends of the brass cylinders through which the oil passes were carefully adjusted, so as to keep the vane steady to the wind's direction.

The clock was cleaned and the orientation tested, and the observer was instructed to perform the operation monthly and send the result to the Meteorological Office.

The time of starting and stopping the instrument noted on the sheets is *local* and not G. M. T.

Valencia, October 11th–13th.—As in the case of Armagh and Mountjoy, the instruments here greatly needed cleaning, not having been dismounted since their erection in March 1892 at the new observatory.

The clocks of both barograph and thermograph were overhauled and cleaned, and new lines attached to the weights, also the lenses, condensers, &c. received the usual attention, and the position of the Zero dots was changed to the winter values.

Mr. Cullum drew my attention to some stray light which fell upon the thermograph cylinder. On examination I found that it came through a certain part of the wet bulb tube, the black of which had flaked off, this part was re-blackened and some card board shields fitted to both lenses as a further protection to keep out reflected light, subsequent photographic sheets showed that the stray light had been effectually blocked out.

In both instruments special attention was given to the light shutters, which had not been working well. These were cleaned and the lever weights carefully adjusted, after which their action was greatly improved, and it is hoped that they will now work satisfactorily.

The thermometers were compared and found to require the following corrections at 55° Faht. :—

Dry bulb standard, 399	$-0^{\circ}\cdot7$
Wet „ „ 473	$-0\cdot3$
Maximum, M.O. 1003	$0\cdot0$
Minimum, „ 2497	$+0\cdot4$*
Standard barometer, attached thermometer, 71062	$-0\cdot1$
Barograph thermometer (no number)	$-2\cdot0$

* As the correction to the minimum thermometer was rather large, the tube was dismounted and the chamber end warmed over a lamp. It was then placed in a vertical position for some time, when the following correction was obtained :—

Minimum, 2497	$0^{\circ}\cdot0$

Wire netting has been fitted to the thermograph screen in accordance with the instructions issued by the Meteorological Council.

The rain-gauge was examined and a slight adjustment made in the fall of the float.

Squeezes were obtained from the self-recording and check gauge funnels, and are sent with this Report.

On dismounting the anemograph, I found that the oil in the direction bearing had become very viscous, this was removed and fresh asbestos lubricant added. The other parts of the instrument

were also cleaned, but we were unable to disconnect the cups from the velocity spindle, as the collar through which the spindle passes had become so incrusted with rust, &c. After repeated efforts, the cups and spindle were taken to the local blacksmith, who succeeded, after making the collar and shaft red hot, in removing the cups.

The instrument was put together and re started between 7 and 8 p.m., but the orientation was not examined till the next morning (October 13), when it was found correct.

The recording parts were generally examined, and the pencil bearings oiled.

The direction fans are a good deal corroded and new ones will be required before long. I would respectfully suggest that, perhaps copper fans would be an improvement, as sheet iron so rapidly corrodes.

(Signed) T. W. BAKER.

R. H. Scott, Esq., F.R.S.

INSPECTOR'S REPORT, 1894. (England S. and E., and the South Midland Counties).

1. TELEGRAPHIC REPORTING STATIONS.

Hurst Castle.—The present observer has been in charge for only a few months, the former observer having been pensioned off by the Trinity House. The instruments are in the garden of the lighthouse, and are attended to by the chief lightkeeper and his wife. Barometers were in good order, but bad light, and I saw no probability of any improvement. The thermometers were well exposed, but the screen needed repairs, and the wet-bulb was very badly mounted. Wind direction was magnetic, not true, and rain-gauge was much too near a hedge. The station is a *very* open one. I re-mounted the wet bulb, and gave minute instructions as to its management, and spent four hours in explaining the action of the various instruments to the observer, who, while *affecting* to understand what was said, was nevertheless, in my opinion, by no means quick at comprehending. Errors in reducing his barometer readings were numerous, and I am sorry to say, that since the inspection the said errors have been very frequent.

Jersey.—Visited during *heavy* rain and strong winds. Barometers in observer's house at St. Aubin's, clean, and apparently well managed. Thermometer screen and rain-gauge on an unused platform of the railway station, well exposed as a whole, but gauge partially affected by a flag-staff, which was much too near to it, and thermometer screen needed considerable repairs. Wet bulb badly mounted, but clean. Remounted it and gave necessary instructions. Position is bad for observations of wind (when Northerly) and of sea disturbance. Sunshine recorder is at Fort Regent, near St. Helier's; it is firmly fixed and exposure is perfect.

With regard to the proposal to shift the instruments to the Jesuit College at Maison St. Louis, and to supply the Rev. M. Dechevrens with other instruments, I beg to report that I visited the College and saw M. Dechevrens, and spent about three hours with him inspecting his grounds (in *pouring* rain), and discussing the question generally. First of all M. Dechevrens was prepared, and anxious, to take over the telegraphic reporting instruments and to send telegrams at once; but as part of a more general arrangement which was to include the grant to the College of a self-registering anemometer, rain-gauge, and sunshine recorder. The grounds of the College are extensive, and there is abundant room for such instruments. Fresh buildings of considerable size are being constructed for astronomical work, and on one of these it was proposed to place the anemometer. I very much doubt, however, whether the position is at *all* likely to prove a good one for anemometry, as it is on the side of a steep hill, which could not fail to affect the wind's record. M. Dechevrens would prefer anemometer, rain-gauge, &c. of some generally approved type to any novel invention, but would be willing to conduct experiments with any *new* form, if wished. He, however, made one condition, viz., that the instruments must be *presented* to the College without any reserve—he would not undertake to receive them at all if required to send the original traces, or, indeed, anything more than an occasional (weekly or monthly) summary, to the Meteorological Office. The instruments, and all their records, must be the property of the College, and completely within the control of himself or his successors. On such questions I, of course, offered no opinion, but said they should be reported to the Council. I do not think, however, that the telegraphic reporting instruments should be transferred to this new position at present, although I think a better position for them should be found before long, as we get really no correct idea of sea disturbance and a very poor one of wind in the present position of the observer.

Dungeness.—Instruments at this station were in good order, excepting the wet bulb, which had two thicknesses of coarse calico on it, and was consequently of little good. Re-mounted it and gave instructions. Wind direction had hitherto been magnetic, and height of barometer above sea is certainly 7 feet greater than has hitherto been accepted. Observer is anxious to report well, and took readily all the suggestions made to him. Thermometer screen needs repairs generally, and re-painting inside. I gave careful attention to the question of the barometric readings, and *hope* some improvement in them may be found in future.

North Foreland.—At this station the barometers were in good order and well read. Wet-bulb mounting defective (two thicknesses of muslin, and dirty), and wind *direction* was magnetic. The new minimum thermometer supplied in the spring had not been taken into use, and the old one was defective. I spoke very strongly about the neglect thus shown, and ordered the new minimum to be placed in the screen at once. I propose to visit this station again shortly. Observer seems to me to have exaggerated force of Northerly winds when at all strong. I

therefore drew his attention to the matter. As a whole, however, he is a competent man, and takes considerable interest in his work.

Cambridge.—The new observer at this station is Miss Walker, one of the assistants in the Astronomical Observatory. She appears to me to be very competent, and most earnest in trying to do the work well. The wet bulb thermometer was too thickly covered with calico, but was clean, though I fear it had been neglected by previous observer, as the bulb had a very thick coating of lime, &c. on it. Re-mounted the instrument, gave all necessary instructions, and left a supply of proper muslin and wick for future use. The bushes, &c. surrounding the enclosure in which the thermometers and rain-gauge are placed have grown very much, and need to be well cut back and lowered, or they may vitiate the readings of the rain-gauge seriously. The position, even then, will not be *thoroughly good,* as tall trees abound in that region; but no better site can at present be found.

Sunshine recorder was on a stand on the roof of the observatory, excellently placed, with perfect exposure.

Yarmouth.—Instruments in same position as for many years past, and carefully managed. Wet bulb thermometer wrongly mounted, but all other instruments good. Re-mounted wet bulb, and left proper muslin, &c. with observer. Corrections to wet bulb and maximum are high.

The yard in which the instruments are placed is smaller than could be wished, but I know of no better site, and certainly of no better observer.

2. Second Order Stations.

Southampton.—The instruments at this station are at the Ordnance Survey Office, and are in charge of the librarian. They are all in excellent order, and are most carefully attended to. Barometer in good light; thermometers in an enlarged "Stevenson" screen, but the enclosure in which they were placed is certainly rather small. It is, however, adjacent to a wide road and large open spaces, so that the indications probably represent the temperature of the locality fairly well. I fear, however, that, in the case of rain with high winds, the rain-gauge *may* get some drops of water from the shrubs which are in different parts of the enclosure. Wet bulb thermometer was very clean and properly moistened. Sunshine recorder is on top of one of the gables of the buildings; the exposure is perfect, but instrument was *slightly* out of the level in an E. to W. direction. This was rectified, and I recommended that it should be cemented into its position.

Eastbourne.—Instruments at this station are in various parts of the town; barometer (out of order) is in one of the shelters under a terrace facing the sea; thermometers are in a Stevenson screen in a large open space near the sea; rain-gauge is in a triangular space in a more central part of the town, while the sunshine recorder is on top of the Grand Hotel. Observer's method of setting the barometer is not at all satisfactory, but improvement was promised. Wet bulb was most unsatisfactory, the bulb being simply smothered with cotton wick, leaving hardly any room for evaporation to affect it. The other instruments were well managed, but the position of the sunshine recorder I consider to be one of extreme danger to the observer when changing the card on dark stormy evenings. The observations are taken with great regularity. I re-mounted the wet bulb, and gave observer careful instructions as to the proper method of managing all of the instruments.

St. Leonards.—Excellent instruments, and, as a whole, well exposed. Mounting of wet bulb thermometer, however, very defective; muslin bad, and too much both of it and of the wick (or, rather, the brown worsted) with which it was mounted. Re-mounted it in proper manner, gave instructions for future, and left supply of proper muslin, &c. Sunshine recorder was slightly out of level in N. to S. direction, and a building, recently erected, was likely to vitiate the indications for about an hour in the early mornings in autumn and spring. Found new position for the instrument, which observer promised to have removed at once. The building was so recently erected that no harm had resulted at time of inspection.

Uppingham.—An excellent station, and observations taken with scrupulous care and promptitude. The thermometer screen (a modified "Glaisher") having become too much sheltered by some trees, the observer proposes to remove it on the 1st January next to a more open space. Instruments are *good.*

Belvoir Castle.—This station has not yet been fully installed, but observer (Mr. Divers, head gardener) *hopes* to begin reporting on 1st January. At present he needs further instruction with regard to wind and cloud observations. Instruments are very accurate. Thermometers are on a very large "Glaisher's" stand. Rain-gauge, a new 8 in., of "Glaisher" pattern, but with a long tube extending to nearly bottom of collecting can, is very well exposed. Sunshine recorder is slightly sheltered to westward and west-north-westward, perfectly open elsewhere. It is a "twin" photographic recorder by Jordan. Bearings are *true.* Barometer, a Fortin's standard, has been recently repaired, but verified only by maker (Negretti and Zambra). Observer is ready to make every arrangement for having a good and continuous "Second Order" Station.

3. Third Order Stations.

Sandgate.—This is a rainfall station only, and the observer does not at present see his way to increasing the work of observing. Gauge is an ordinary 5 in. metal gauge in good order, and

situated near the edge of a kind of terrace (undercliff) overlooking the main street of the town and facing the sea. It is about on a level with the tops of the houses in the lower street, and the effect of currents of wind blowing over the edge of the cliff is thus cancelled. Rim was 1 ft. above the ground and *about* 47 ft. above sea, but Mr. Stilgoe (the observer and town surveyor) promised to level it accurately and send the results to the Meteorological Office.

Kearsney Abbey (near Dover).—Rainfall station only, and observer does not propose to make any increase in the meteorological work. Gauge, a 5 in. ordinary metal gauge, was *very* badly placed, catching the droppings from several bushes, &c., with the branches of which it was largely covered. Found a better (but not *excellent*) position for the instrument, and Mr. Curtis (the owner of the estate), whose gardener takes the observations, promised that it should be at once shifted. I do not think the records hitherto recorded are fit to be published, owing to the very bad position of the gauge.

* *Ketton Hall.*—Full set of instruments, but observations made only once daily. Mr. Divers (late head gardener) has now gone to Belvoir Castle, but the new one (Mr. Drabble) appears to read the instruments correctly, and Mr. Coventry, the owner of the instruments, applies all the corrections accurately. The instruments are in a hollow. Dry, wet, maximum, and minimum thermometers are in a Stevenson's screen fairly well exposed, but *grass* thermometer not at all well exposed and reading about 1·5 too low. Gave instructions to cut the grass, &c. as necessary. Rain-gauge badly placed, being dominated by an apple tree to south-westward of it, the tree having grown gradually during several past years. Mr. Coventry has agreed to shift the instrument to a better position on January 1st, 1895. Mr. Coventry is not inclined to take evening observations.

* *The Holmes, Ketton.* (Mr. Coventry's private house).—Rainfall station only. Gauge, a 5-in. Snowdon pattern, not very well exposed, in a kitchen garden on east side of house. Exposure would be good but for some trees to the northward of gauge which dominate it too much. Observations are very regularly made, but observer will not do more than at present.

* *Colley Weston.*—Rainfall station only. Observations taken by Miss Amy Tasker. Gauge belonging to Mr. Coventry, of the Holmes, Ketton. The instrument is a 5 in. Snowdon gauge, *very* well placed near the church at an altitude of about 270 feet above mean sea level. Exposure could hardly be better, and readings are taken regularly.

Chatham.—Observer is the Instructor in Survey. Barometer, a very good Fortin standard, not in a good light; recently cleaned and verified at Kew. *Thermometers*—dry, wet, maximum and minimum, very good instruments, well exposed in a Stevenson's screen. Solar radiation read six degrees too low (new one at once put in its place). Rain-gauges, three in number, are in 8 in. "Glaisher's"; are too near the open fence of the enclosure, but, on application, the fence will be thrown back 5 ft., which will make the exposure very good. Observer cannot take more than one set of observations per day.

Rothamsted (Harpenden).—Barometer good; dry and wet, maximum and minimum thermometers, in a Stow's screen, slightly sheltered by trees, but fairly well exposed, for all that. Solar radiation in good position; terrestrial radiation utterly useless, hitherto being thoroughly screened by surrounding objects from radiation of *any* kind. Instrument to be moved at once. Sunshine recorder *very* well exposed, but *slightly* out in azimuth lately (to be rectified). Rain-gauge *well* exposed. Observations now intelligently made by man named Reed, one of the assistants. Cannot take more than one observation a day. Arrears of returns to be dealt with at once.

(Signed) FREDC. GASTER.

TABLE of CORRECTIONS necessary to bring the READINGS of the THERMOMETER into agreement with the INSPECTOR'S STANDARD.

Names of Stations.	Corrections.					Reading of Inspector's Standard (corrected.)	Notes.
	Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Spare.		
	1. TELEGRAPHIC REPORTING STATIONS.						
Hurst Castle - -	−·7	+·1	−·7	−·4	—	62·1	
Jersey - - -	−·1	−·3	−·1	−·3	—	61·7	
Dungeness - -	−·1	−·1	0·0	−·1	—	61·9	
North Foreland - -	−·4	−·1	+·5	+·6*	−·4	59·6	* Out of order, new one substituted.
Cambridge - -	−·3	−·2	−·5	+·7	—	59·8	
Yarmouth - -	−·5	−1·0	−1·0	·0	—	60·0	Substituted dry for wet and *vice versâ*.

* It is highly probable that Mr. Coventry will be removing in about 12 or 18 month's time, and he will take all his instruments with him.

Names of Stations.	Corrections. Dry Bulb.	Wet Bulb.	Maximum.	Minimum.	Spare.	Reading of Inspector's Standard (corrected).	Notes.
	2. Second Order Stations.						
Southampton - -	− °·1	− °·3	+ °·1	+ °·2	+ °·2*	60°·2	* Grass Min. Ther.
Eastbourne - -	− ·1	− ·1	0·0	+ ·1	—	68·0	
St. Leonards - -	− ·4	− ·6	0·0	0·0	65·0*	65·0	* A Kew Standard.
Uppingham - -	− ·2	0·0	− ·4	− ·3	—	59.5	
Belvoir Castle - -	0·0	0·0	0·0	0·0	+0·6*	52·0	* Grass Min.
	3. Third Order Stations.						
Ketton Hall - -	−·2	− ·4	+ ·1	− ·2	+0·3*	51·1	* Grass Min.
Chatham - -	−·3	− ·2	+ ·5	− ·1	+5·8*	53·8	* Solar Max. in Vac. (changed immediately) new one +0·5.
Harpenden - -	+ ·2	+ ·1	− ·6	+ ·1	+1·7*	52·0	* Spherical bulb grass min.

In each case the thermometers were in water for more than 60 minutes before being read.

Submitted—The following:—

Return of Stock of "A" Instruments at Her Majesty's Dockyards and in the Office, October 1st, 1894.

Place and Date.	Particulars.	Barometers. Mercurial.	Aneroid.	Thermometers. Ordinary.	Max.	Min.	Screens.
Meteorological Office, July 1st to October 1st, 1894.	Available - -	32	43	55	1	—	23
	Received, new - -	—	—	100	100	100	—
	„ repaired, cleaned, &c.	12	16	11	7	1	—
	Total - -	44	59	166	108	101	23
	Issued - - -	28	31	116	52	50	8
	Available - -	16	28	50	56	51	15
	Ordered - -	—	—	—	—	—	—
	Repairing - -	25	—	5	—	—	—
	Total available and ordered, or repairing.	41	28	55	56	51	15
Portsmouth - - October 1st, 1894.	Establishment - -	23	53	150	50	50	25
	In Store - -	22	49	145	50	53	28
	Deficiency - -	1	4	5	—	—	—
Devonport - - October 1st, 1894.	Establishment - -	22	50	140	45	45	22
	In Store - -	8	32	114	34	40	20
	Deficiency - -	14	18	26	11	5	2
Chatham - - October 1st, 1894.	Establishment - -	18	54	120	35	35	25
	In Store - -	13	45	97	20	25	23
	Deficiency - -	5	9	23	15	10	2
Sheerness - - October 1st, 1894.	Establishment - -	6	22	40	15	15	10
	In Store - -	6	21	34	13	14	10
	Deficiency - -	—	1	6	2	1	—

(Signed) R. Strachan,
25th October 1894.

Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
1894.	Establishment at Meteorological Office	45	120	250	80	80	50
Oct. 1	In Stock - - - -	16	28	50	56	51	15
„	Deficiency - - - -	29	92	200	24	29	35
„	Deficiency at Portsmouth - -	1	4	5	—	—	—
„	„ Devonport - -	14	18	26	11	5	2
„	„ Chatham - -	5	9	23	15	10	2
„	„ Sheerness - -	—	1	6	2	1	—
„	Total deficiency. Home yards -	20	32	60	28	16	4
„	Deficiency at Queenstown - -	—	—	—	—	—	—
„	„ Gibraltar - -	—	—	—	—	—	—
„	„ Malta - - -	—	1	7	2	—	—
„	„ Bombay - -	—	—	—	1	1	—
„	„ Halifax - - -	—	—	9	—	—	1
„	„ Bermuda - -	—	—	—	—	—	—
„	„ Jamaica - -	—	—	—	—	—	—
„	„ Cape Good Hope -	2	2	—	—	—	—
„	„ Trincomalee - -	—	—	—	—	—	—
July 1	„ Hong Kong - -	7	3	7	4	—	2
Oct. 1	„ Coquimbo - -	—	—	—	—	—	—
„	„ Sydney - - -	—	1	6	1	2	—
„	„ Esquimalt - -	—	—	—	—	—	—
	Total deficiency. Dockyards abroad	9	7	29	8	3	3
	Total deficiency - - -	56	131	289	60	48	42
	Under repair - - -	25	—	5	—	—	—
	Total required - - -	31	131	284	60	48	42

(Signed) R. STRACHAN.

It was resolved, on the recommendation of the Hydrographer, to order, to supply deficiency on the July account (Minutes, p. 40).

	Estimated Cost. £	s.	d.
30 barometers - - - -	127	10	0
110 aneroids - - - -	261	5	0
240 thermometers - - -	84	0	0
50 pairs, maximum and minimum do. -	65	0	0
36 ship screens - - -	18	18	0
	£556	13	0

Submitted—The following list of publications, which had been received since the last meeting:—

Calcutta, Meteorological Office.—Rainfall of India. Third year, 1893.

Washington, Department of Agriculture.—Report of the Chief of the Weather Bureau for 1893.

Meinardus, W.—Beiträge zur Kenntniss der klimatischen Verhältnisse des nordöstlichen Theils des Indischen Ozeans.

—— —— —— Ueber die Methoden der Verarbeitung von meteorologischen Beobachtungen zur See.

Symons, G. J.—On the amount of evaporation.

Helsingfors, Institut Météorologique Central.—Observations faites à l'Observatoire magnétique et météorologique de Helsingfors, sous la direction de J. J. Nervander, Vols. 1–4. Deuxième section. Observations météorologiques.

Chree, C.—Note on the relation between the co-efficients of pressure in thermometry.

Vaughan, J. D. W.—Meteorological observations taken at Suva, Fiji, during 1893.

Wharton, W. J. L.—Address to the Geographical Section of the British Association, Oxford, 1894.

THE Fourth Annual General Meeting of the Meteorological Council was held at 63, Victoria Street, S.W., on Wednesday, November 14th, 1894, at the hour of 2h. 30m. p.m.

The following Members were present:—

MR. GALTON in the Chair.
Mr. BUCHAN.
Professor DARWIN.
Mr. STONE.
The HYDROGRAPHER.
Mr. ROBERT H. SCOTT (Secretary).

The Chairman was unable to attend in consequence of an accident.

The Secretary read the notice convening the meeting as follows:—

Meteorological Office, 63, Victoria Street, S.W.,
5th November 1894.

SIR,

I BEG to inform you that the fourth ordinary general meeting of the Meteorological Council will be held on Wednesday, the 14th instant, at 2h. 30m. p.m., for the consideration of the expenditure of the year 1893–94, the preparation of the estimates for the year 1895–96, the appointment of auditors for a year ending 30th June 1895, and for the transaction of other ordinary business.

A draft copy of the proposed estimates will be sent shortly.

I am, &c.
(Signed) R. H. SCOTT,
Secretary.

The Secretary reported that in accordance with the Articles:—

1. The Council had submitted a Report of its proceedings to the Royal Society for presentation to Parliament.

2. That the annual estimates for 1894–95 had been prepared, submitted to the Treasury and approved; and that the accounts up to June 30th, 1894, had been examined by two members of the Council, and had been submitted for audit in the usual course.

3. That ordinary meetings of the Council had been held on the following days:—

1893	-	November	15	1894	-	February	21	1894	-	May	16
,,	-	,,	29	,,	-	March	7	,,	-	,,	30
,,	-	December	13	,,	-	,,	21	,,	-	June	13
1894	-	January	10	,,	-	April	4	,,	-	July	11
,,	-	,,	24	,,	-	,,	18	,,	-	October	17
,,	-	February	7	,,	-	May	2	,,	-	,,	31

4. That the proceedings had been regularly recorded and printed.

The meeting then adjourned.

The Minutes of the last ordinary meeting (October 31) were read and confirmed.

Mr. Buchan was appointed auditor of the accounts, with the Chairman, for a year commencing July 1, 1894.

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of October 1894 :—

The letters used have the following signification :—

a = complete success.
b = partial (*i.e.*, more than half) success.
c = partial failure.
d = total failure.

OCTOBER.

Districts.		Per-centages.			Per-centage of Success a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	42	45	44	77
,,	b	32	35	33	
,,	c	16	10	13	
,,	d	10	10	10	
Scotland, E.	a	39	48	44	76
,,	b	39	26	32	
,,	c	19	10	15	
,,	d	3	16	9	
England, N.E.	a	45	61	53	79
,,	b	36	16	26	
,,	c	19	7	13	
,,	d	0	16	8	
England, E.	a	68	68	68	89
,,	b	23	19	21	
,,	c	6	10	8	
,,	d	3	3	3	
Midland Counties	a	55	68	62	88
,,	b	26	26	26	
,,	c	6	6	6	
,,	d	13	0	6	
England, S.	a	81	68	75	93
,,	b	13	23	18	
,,	c	3	6	4	
,,	d	3	3	3	
Scotland, W.	a	48	52	50	73
,,	b	16	29	23	
,,	c	23	10	16	
,,	d	13	9	11	
England, N.W.	a	55	55	55	79
,,	b	19	29	24	
,,	c	23	10	17	
,,	d	3	6	4	
England, S.W.	a	58	61	60	79
,,	b	13	26	19	
,,	c	19	10	15	
,,	d	10	3	6	
Ireland, N.	a	42	61	52	76
,,	b	35	13	24	
,,	c	10	16	13	
,,	d	13	10	11	
Ireland, S.	a	45	58	52	76
,,	b	26	23	24	
,,	c	26	13	20	
,,	d	3	6	4	
SUMMARY.					
British Isles	a	53	59	56	81
,,	b	25	24	25	
,,	c	15	10	12	
,,	d	7	7	7	

Submitted—The following memoranda :—

MATERIALS for preparing ESTIMATES for 1895-96.

	Expenditure 1893-94.	Estimated Expenditure 1895-96.	Proposed for 1895-96.	Voted for 1894-95.
	£	£	£	£
Administration :				
(1.) Council - - - - -	991	991	1,000	1,000
(2.) Secretary - - - - - -	800	800	800	800
(3.) Salaries :				
Chief Clerk - - - - -	333			
2 Junior Clerks - - - -	260			
Office Keeper - - - -	77			
2 Messengers - - - - -	116			
Extra Commissionaires - - -	15			
Caretaker - - - - -	103			
	904			
Add for estimated additions to or increments of salaries - - - - - -	4	908	890	780
(4.) Rent, fuel, and lighting :				
Rent - - - - - -	635			
Fuel - - - - - -	45			
Gas - - - - - -	25			
	705	705	710	710
(5.) Incidental and contingent expenses :				
Office Keeper's contingent account - -	87			
Postage - - - - -	59			
Furniture and Office repairs - - -	161			
Carriage of parcels, &c. - - -	14			
Books and printing - - - -	66			
Sundries - - - - -	15			
	402			
Deduct repayments under this head, including Commission - - - - -	10	392	370	470
(6.) Pensions :				
Capt. H. Toynbee - - - -	144			
Mr. J. S. Harding, senr. - - - -	43			
	187			
Deduction on account of Mr. J. S. Harding, senr. -	43	144	150	190
Special Researches and Experiments :				
(1.) Salaries :				
1 Junior Clerk - - - -	150			
Female staff - - - - -	289			
	439			
Transfer from head *Land Meteorology* -	250			
	689			
Add for estimated addition to or increments of salaries -	31	720		
(2.) Other charges :				
Bridled anemometer (Holyhead) - -	14			
Instruments - - - - -	17			
Calculation of hourly means - - -	60			
Sundries - - - - -	7			
	98			
Deduct for calculation of hourly means, now ceased -	60	38	1,000	1,000
Carried forward - - -	- -	4,698	4,920	4,950

	Expenditure 1893-94.	Estimated Expenditure 1895-96.	Proposed for 1895-96.	Voted for 1894-95.
		£	£	£
Brought forward - - -	- -	4,698	4,920	4,950
Land Meteorology:				
(1.) Observatories and stations:				
Aberdeen (allowance 275*l.*) - - -	278			
Armagh („ 50*l.*) - - -	51			
Ben Nevis („ 100*l.*) - - -	100			
Falmouth („ 250*l.*) - - -	253			
Fort William („ 250*l.*) - - -	252			
Glasgow („ 75*l.*) - - -	78			
Kew („ 400*l.*) - - -	418			
Stonyhurst („ 56*l.*) - - -	57			
Valencia (including expenses in connexion with Westwood House) - - - -	595			
Anemograph stations - - - -	73			
Meteorological Societies (Observations 2nd Order) -	205			
Instruments and sunshine cards - - -	22			
Sundries, forms, &c. - - - -	8			
	2,390			
£				
Deduct expenses in connexion with Westwood House - - - - - 112				
Deduct for grazing receipts, sale of forms, &c. 38				
150				
		2,240	2,240	2,300
(2.) Salaries:—Discussion and reduction of observations:				
2 Senior Clerks - - - -	525			
7 Junior Clerks - - - -	870			
4 Unclassified Clerks - - - -	145			
Extra work - - - - -	7			
	1,547			
Transfer to head of *Special Researches* - -	250			
	1,297			
Estimated addition to or increments of salaries -	70			
		1,367	1,360	1,300
Weather Information and Forecasts - - - -				
(1.) Telegraphic reports and storm warnings:—				
Reports from inland stations - - -	579			
Reports from abroad - - - -	108			
Reports sent abroad - - - -	383			
Storm warnings - - - -	258			
Hay harvest forecasts - - - -	31			
Private wires - - - - -	58			
Payments to reporters, &c. (allowances and expenses) - - - - -	627			
Sundry telegrams, forecasts, &c. - - -	34			
Postage of reports and forecasts - - -	258			
Instruments, &c. - - - - -	50			
Wrappers, printing, &c. - - - -	19			
Weekly Reports - - - - -	49			
District messenger service - - - -	9			
Sundries - - - - - -	22			
	2,485			
Add for payments to reporters (above statement contains only 3 quarterly payments) - - -	50			
	2,535			
Deduct repayments during the same period, including 26*l.* for instruments - - - -	720			
		1,815	1,850	2,000
Carried forward - - -	- -	10,120	10,370	10,550

	Actual Expenditure 1893–94.	Estimated Expenditure 1895–96.	Proposed for 1895–96.	Voted for 1894–95.
	£	£	£	£
Brought forward - - -	- -	10,120	10,370	10,550
(2.) Salaries:—Preparation and issue of reports and forecasts.				
1 Senior Clerk (9 hours daily) - - -	309			
7 Junior Clerks (5 work 9 hours daily) - -	1,157			
1 Unclassified Clerk - - - -	53			
2 Messengers - - - - -	114			
Addition for late evening and Sunday attendance, and for extra work - - - - -	228			
	1,861			
Add for estimated addition to or increments of salaries	23	1,884	1,880	1,850
Inspections:				
Mr. Baker - - - - - -	48			
„ Buchan, salary and expenses - - -	197			
„ Constable - - - - -	8			
„ Curtis - - - - - -	5			
„ Ley, salary and expenses - - -	245			
Royal Meteorological Society - -	25			
Mr. Scott - - - - - -	61			
	589			
Deduct Mr. Ley's travelling expenses which referred to year 1892–3 - - -	57	532	530	530
Possibly the salary of one Inspector will be saved.				
Ocean Meteorology:				
(1.) Salaries:—Discussion and reduction of observations:—				
Marine Superintendent - - - -	400			
1 Senior Clerk (in charge of instruments) -	333			
1 „ „ („ Marine Rooms) -	275			
4 Junior Clerks - - - - -	660			
3 Unclassified Clerks - - - -	129			
	1,797			
Deduct proportion chargeable to care and issue of instruments (say) - - - -	200			
	1,597	1,597	1,600	1,600
(2.) Salaries:—Proportion chargeable to care and issue of instruments - - - - -	- -	200	200	200
(3.) Supply of instruments to the Royal Navy:				
Instruments, repairs, &c. - - -	469			
Verifications - - - - -	41			
Packing cases - - - -	16			
	526			
Deduct repayments under this head - -	4			
	522	(*a*) 422	400	350
(4.) Supply of instruments, &c. to Mercantile Marine:				
Instruments, repairs, &c. - - -	217			
Verifications - - - - -	34			
Agents' fees, &c. - - - -	99			
Presentation labels and sundries - -	5			
	355			
Deduct repayments under this head - -	26			
	329	(*a*) 290	300	200
(*a*) The estimated expenditure under sub-heads (3) and (4) is taken as the approximate mean net expenditure of two years ending 31st March 1894.				
(5.) Distant island or coast stations - - -	14	20	20	20
The payments under this head are irregular.				
Totals - - - £	- -	15,065	15,300	15,300

SYNOPSIS of OFFICE SALARIES AND PENSIONS (estimated Expenditure).

Service.	1895-96.	1894-95.	1895-96. Increase.	1895-96. Decrease.
	£	£	£	£
Administration	1,708	1,580	128	—
Special Researches	720	706	14	—
Land Meteorology	1,367	1,304	63	—
Weather Information	1,884	1,852	32	—
Ocean Meteorology	1,797	1,809	—	12
Pensions	144	187	—	43
Totals £	7,620	7,438	237	55

METEOROLOGICAL OFFICE. ESTIMATES for the Year 1895–96.

Heads of Service.	Proposed for 1895-96.		Voted for 1894-95.		1895-96. Increase.	1895-96. Decrease.
Administration:	£	£	£	£	£	£
Payment of Council	1,000		1,000			
Secretary	800		800			
Salaries and wages	890		780			
Rent, fuel, and lighting	710		710			
Incidental and contingent expenses	370		470			
Pensions	150		190			
		3,920		3,950	—	30
Special Researches and Experiments:						
Salaries	720		700			
Other charges	280		300			
		1,000		1,000	—	—
Land Meteorology:						
Observatories and stations	2,240		2,300			
Salaries:—Discussion and reduction of observations	1,360		1,300			
		3,600		3,600	—	—
Weather Information and Forecasts:						
Telegraphic reports and storm warnings	1,850		2,000			
Salaries:—Preparation and issue of reports and forecasts	1,880		1,850			
		3,730		3,850	—	120
Inspections:						
Salaries and travelling expenses		530		530	—	—
Ocean Meteorology:						
Salaries:—Discussion and reduction of observations	1,600		1,600			
Expenses incidental to the supply of instruments:						
Care and issue of instruments	200		200			
Royal Navy	400		350			
Mercantile Marine	300		200			
Distant island (and coast) stations	20		20			
		2,520		2,370	150	—
Totals £		15,300		15,300	150	150

The Secretary submitted proofs of the proposed preface and introduction to the Red Sea charts, and asked for instructions as to the arrangement of the respective Wind and Current charts for binding.

It was resolved that the twelve monthly Wind charts should be placed consecutively and then followed by the twelve Current charts.

The Hydrographer drew the attention of the Council to the fact that the staff of the Marine Branch of the Office was not numerous enough to complete the Current charts for the several oceans for publication within reasonable time.

He was able to announce that the Admiralty had placed the services of Lieutenant Charles V. Smith at his disposal for some months, and that he would be able to provide room at his own office for that officer, who would be occupied with the preparation for publication of some of these Current charts. This arrangement would entail no charge on the funds of the Council.

The proposal of the Hydrographer was accepted with thanks.

The estimates were approved, and the Secretary was instructed to forward a copy to the Treasury (P.C. 2000).

Mr. Scott reported that about half the instruments, the supply of which had been sanctioned as on last Minutes (p. 58), had been ordered. He was instructed to complete the order for the aneroids without delay.

In answer to inquiry, Mr. Scott stated that of late years Kew certificates had not been obtained for aneroids. The certificates issued formerly (some of 1888 were exhibited) gave readings at every inch, from 30 ins. to 26 ins., "with pressure diminishing." It had been found that no aneroids were ever rejected at Kew, and the practice of sending the instruments there had been discontinued. It was resolved that all aneroids be verified in future at Kew.

Mr. Buchan was requested to confer with the Hydrographer and with Mr. Chree at Kew Observatory, and to report to the Council as to what standard of accuracy should be laid down before accepting in future aneroids for purchase for meteorological purposes.

Read—A memorandum stating that since the last meeting four logs had been received, two of them being "excellent." Mr. Scott was instructed to convey the marked thanks of the Council to the observers.

Submitted—The following reports of work during the month of October 1894 :—

MARINE BRANCH.

November 13, 1894.

Examined 10 new logs and five lighthouse registers.

For the district between the Cape of Good Hope and New Zealand tabulating and discussing observations of fog, obtaining the range of sea temperature, and preparing monthly charts of winds, currents, pressure, and temperature of the air and of the sea.

Arranging Introductory Remarks and notes on Currents for the Red Sea publication.

Preparation and extraction of the data for the district in the Southern Oceans, between the longitudes of 10° E. and 90° W.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.
(To 31st October 1894.)

Weekly Weather Report.—All numbers issued promptly, to date.
Monthly Summaries.—September, gone "for press," Appendix I, Part 3 published.
Daily Weather Report.—All numbers issued promptly.
Primary Checking of Storm Warnings issued 1894.—Done to date
Checking of (8.30 *p.m.*) *Forecasts.*—Done to date.
Hay Harvest Forecasts, 1894.—Checking commenced.
Rainfall Publication.—First 48 pages gone 'for press." "Copy" for 30 additional stations sent to printer.
Inspection of Stations.—England S. and E. and S. Midlands. Completed.

(Signed) FREDC. GASTER.

Telegraphic Branch,
14th November 1894.

PANTAGRAPH ROOM.

November 1, 1894.

The proof sheets of "Hourly Means" for 1891 are still undergoing revise, and the Appendix is now in the Printer's hands. The mean values for 1892 are progressing.

The routine work of the Room has been kept strictly up to date.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

November 1, 1894.

Since the date of the last Report the under-mentioned work has been done :—

Examinations.

January–May, 1894.—Kew records completed.
January–October, 1894.—Proceeded with.
Weekly examination (on receipt) of curves and documents from all observatories.

Miscellaneous.

Diurnal Range of Rainfall, 1871–1880.—Examination and correction of the hourly values proceeded with.
Revising and correcting proofs of Forms Nos. 1 (Thermograph working Sheet) and 3 (Barograph working Sheet).
General routine work.

(Signed) T. E. ALLEN.

Submitted.—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

A + B (successful) - - -	=	39 districts.
C (failures) - - - -	=	4 districts.

GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,
14th November 1894.

Submitted—The following statement of accounts :—

	£	*s.*	*d.*
Cash balance on 30th October - - -	4,241	4	5
Receipts from 31st October to 13th November -	10	19	2
	4,252	3	7
Cheques drawn from 31st October to 13th November	1,000	11	2
	£3,251	12	5

Submitted—The following list of publications which had been received since the last meeting :—

Riccò, A. e Saija, G.—Confronto della temperatura all' Osservatorio Etneo ed all' Osservatorio di Catania.
Riccò, A. e Arcidiacono, S.—Osservazioni puteometriche eseguite nell' Osservatorio di Catania.
Laurie, R. H.—A directory for the North Atlantic Ocean. 15th edition.
Kammermann, A.—Résumé météorologique de l'année, 1893, pour Genève et le Grand Saint-Bernard.
Eberswalde, Hauptstation des forstlichen Versuchswesen in Preussen. — Jahresbericht. xix Jahrg., 1893.
Bombay, Government Observatory.—Magnetical and meteorological observations made at the Government observatory, Bombay, in the year 1893.
Peking, Inspectorate General of Customs.—Medical reports for the half-year ended 30th September 1891. 42nd issue.
Shanghai Meteorological Society.—Second Annual Report, for the year 1893, on the typhoons of the year 1893, by Rev. F. S. Chevalier.
Helsingfors, Finska Vetenskaps-Societeten. — Öfversigt af Finska Vetenskaps-Societetens Förhandlingar. xxxv., 1892–93.
Schreiber, P.—Ableitung der sogenannten Trägheitscurve auf der Erdoberfläche.
Upsala.—Procès-verbaux du comité de l'atlas de nuages à Upsala.
London, Meteorological Office.—Meteorological observations at Stations of the Second Order for the year 1890.

63, *Victoria Street, November* 28, 1894.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

PROFESSOR DARWIN.	MR. STONE.
MR. GALTON.	THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (November 14) were read and confirmed.

Mr. Scott reported that the stock of aneroids in the Office had been sent to Kew as directed.

The air-pump belonging to the Office was brought up and exhibited to the Council, and directions were given to have the pump set up, and to test all aneroids before issue as to their being in working order.

Read—Letters 1937 and 2008 from Mr. Chree as to the performance of the electrical anemometer, and it was resolved to instruct him to continue the trial of the instruments. (Minutes, p. 27) (P.C. 2078).

The General Inspection Reports (pp. 29, 31, 33, 34, 50, 51, and 55) were considered.

Mr. Scott reported that he had authorised Mr. Cullum to have certain repairs to the roof and sewerage, &c. of the observatory executed.—Approved.

With reference to Jersey (p. 55), Mr. Scott was instructed to make inquiries as to the possibility of finding a better station than St. Aubin's, which is not satisfactory as to exposure, and to inform Father Dechevrens that the situation of his proposed observatory was not thoroughly satisfactory. (P.C. 2073.) (Minutes, 1893, p. 64.)

With reference to Mr. Curtis's Report on certain anemometers (p. 37), a letter from Mr. Munro (M.O. 2114) was read, as to the repairs suggested for the Holyhead instruments, and Mr. Scott was instructed to procure an estimate. (P.C. 2079.)

Read—A memorandum from Mr. Baillie reporting that since last meeting eight logs had been received, three of them being "excellent."

Mr. Scott was instructed to present the charts (O. 90) to Captain Thomas Free R.N.R., and to convey the best thanks of the Council to the other observers.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council:—

WARNINGS ISSUED.

A + B (successful) - - - -	= 17 districts.
C (failures) - - - -	= 3 districts.

GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,
November 28, 1894.

Mr. Scott reported that as the building in process of erection adjacent to the Office had seriously affected the exposure of the sunshine recorder and other instruments on the roof, he had made application to the Wesleyan Training College in Horseferry Road to have the recorder erected on their tower, which afforded a free exposure.

A letter (M.O. 2,100) was read from the Superintendent expressing readiness to grant the use of the site, on payment of a nominal rent of 5*s.* per annum.—Approved.

Messrs. Harries and Brodie applied for leave to make extracts from Office data in preparation of papers for submission to scientific societies.—Permission granted if documents are not removed from the office.

Reported—That H. A. Hewitt had been superannuated, on reaching the age of 21, on the 23rd instant. The Council sanctioned his temporary employment until Easter, in order to give assistance in training his successor.

Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 13th November - -	3,251	12	5
Receipts from 14th to 27th November - -	7	9	6
	3,259	1	11
Cheques drawn from 14th to 27th November -	86	10	6
Balance on 27th November - -	3,172	11	5

Submitted—The following list of publications which had been received since the last meeting :—

Klengel, F.—Über die aperiodischen Schwankungen der Temperatur im Gebiet des Pic du Midi und Puy de Dôme sowie über die Ableitung 30 jährigen Normalmittel für beide Gipfelstationen.

—— Das meteorologische Observatorium auf dem Mont Ventoux (1908 m) in Süd-Frankreich.

Coimbra, Observatorio.—Observações metcorologicas e magneticas feitas no anno de 1893. Resumo das observações meteorologicas dos annos de 1866 a 1890.

Calcutta, Meteorological Office.—Report on the administration of the Meteorological Department of the Government of India in 1893–4.

Curtis, R. H.—Some characteristic features of gales and strong winds.

Scott, R. H.—Fogs reported with strong winds during the 15 years 1876–90 in the British Isles.

Dickson, H. N.—Report on physical investigations carried out on board H.M.S. "Jackal," 1893–94.

Carlsruhe, Centralbureau für Meteorologie und Hydrographie—Niederschlagsbeobachtungen der meteorologischen Stationen im Grossherzogthum Baden. 1889, 2 Halbj. 1894, 1 Halbj.

Marriott, W.—Audibility of "Big Ben" at West Norwood under certain meteorological conditions.

Vienna, K. K. Central-Anstalt für Meteorologie und Erdmagnetismus.—Jahrbuch. 1892.

Washington, Smithsonian Institution.—Annual report of the Board of Regents. 1889–92.

Bombay Government Observatory.—Report on the condition and proceedings of the Government Observatory, Colába, for the year which ended with the 30th June 1894.

Todd, Sir C.—Meteorological work in Australia : a review.

Natal Observatory.—Report upon the work of the Natal Observatory during the twelve months ended 30th June 1894.

Washington, United States Naval Observatory.—Meteorological observations and results. 1889.

—— —— Magnetic observations. 1892.

Kazan, Observatoire Magnétique.—Observations. 1892.

Cambridge (Mass.), Astronomical Observatory of Harvard College.—Annals. Vol. xl., Part iii. Observations made at the Blue Hill Meteorological Observatory, Mass., U.S.A., in the year 1893.

Boston, Mass., Weather Bureau.—Observations of the New EnglandWeather Service in the year 1892.

63, *Victoria Street*, *December* 12, 1894.

PRESENT:

MR. GALTON IN THE CHAIR.

PROFESSOR DARWIN. | MR. STONE.

THE HYDROGRAPHER.

In the absence of the Secretary the Marine Superintendent was in attendance.

The Minutes of the last meeting (November 28) were read and confirmed.

With reference to the aneroids recently ordered (Minutes, p. 66), it was decided that the makers of the aneroids ordered be communicated with, to the effect that if it is not too late to make the change, it would be preferred by the Council that the scale should extend to 26 ins. only, and be carried round the dial so that it should be more open than at present.

Reports on the subject of aneroid testing were read from Dr. Buchan, the Hydrographer, and Mr. Chree (Minutes, p. 67), and it was resolved that the correspondence, with the notes of the Council marked thereon, be submitted to Dr. Buchan before being printed on the Minutes.

Read—A Memorandum from Mr. Baillie, stating that since last meeting three logs had been received, one of them being "excellent." It was resolved that the thanks of the Council be given to the observer.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council:—

WARNINGS ISSUED.

A + B (successful)	- - -	= 11 districts	on 2 days.
C (failures)	- - -	= 8 „	on 1 day

GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,
December 12, 1894.

Instructions were given to modify in future the form of this return.

Reported that G. H. Bolton had been engaged as a boy clerk at 12*s*. 6*d*. per week, to replace A. H. Hewitt. (Minutes, p. 70.)

Resolved—That the usual bonus of 3*l*. 3*s*. 0*d*. be given to those of the telegraphic reporters who have discharged their duties satisfactorily during the year. (Minutes, 1893, p. 68.)

Submitted—The following statement of accounts:—

	£	*s*.	*d*.
Cash balance on 27th November - - - -	3,172	11	5
Receipts from 28th November to 11th December -	5	8	2
	3,177	19	7
Cheques drawn from 28th November to 11th December -	720	6	0
Balance on 11th December - - - - -	2,457	13	7

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of November 1894:—

The letters used have the following signification :—
a=complete success. | **c**=partial failure.
b=partial (*i.e.*, more than half) success. | **d**=total failure.

NOVEMBER.

Districts.		Per-centages. Wind.	Weather.	Average Forecast.	Per-centage of Success. a + b.
Scotland, N.	a	43	73	58	85
,,	b	33	20	27	
,,	c	17	7	12	
,,	d	7	0	3	
Scotland, E.	a	57	57	57	79
,,	b	23	20	22	
,,	c	17	23	20	
,,	d	3	0	1	
England, N.E.	a	60	47	54	80
,,	b	20	33	26	
,,	c	17	10	14	
,,	d	3	10	6	
England, E.	a	63	50	57	90
,,	b	27	40	33	
,,	c	7	10	9	
,,	d	3	0	1	
Midland Counties	a	43	43	43	82
,,	b	37	40	39	
,,	c	17	10	13	
,,	d	3	7	5	
England, S.	a	77	57	67	92
,,	b	17	33	25	
,,	c	3	10	7	
,,	d	3	0	1	
Scotland, W.	a	44	60	52	84
,,	b	33	30	32	
,,	c	13	10	11	
,,	d	10	0	5	
England, N.W.	a	54	63	59	89
,,	b	33	27	30	
,,	c	10	10	10	
,,	d	3	0	1	
England, S.W.	a	60	70	65	94
,,	b	34	23	29	
,,	c	3	7	5	
,,	d	3	0	1	
Ireland, N.	a	50	67	59	79
,,	b	17	23	20	
,,	c	23	7	15	
,,	d	10	3	6	
Ireland, S.	a	30	60	45	77
,,	b	33	30	32	
,,	c	20	10	15	
,,	d	17	0	8	
SUMMARY.					
British Isles	a	53	59	56	85
,,	b	28	29	29	
,,	c	13	10	11	
,,	d	6	2	4	

Submitted.—The following reports of work during the month of November 1894:—

MARINE BRANCH.

December 11, 1894.

Examined 13 new logs.

Discussion of the meteorology of the district between the Cape of Good Hope and New Zealand, and preparing monthly charts representing the results for the several elements.

Making steady progress with the preparation and extraction of ocean data in the area south of the Equator between the longitudes of 10° E. and 90° W.

Copying from log No. 9,399 various notices for the Hydrographic Office and the Royal Astronomical Society.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE,
Marine Superintendent.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.
(To 30th November 1894.)

Weekly Weather Report, 1894.—All numbers issued promptly.
Appendices, all well in hand; *Summaries* issued to end of September; that for *October*, in the press.
Daily Weather Reports, 1894.—All numbers issued promptly.
Correction Sheets.—January and February issued, March and April nearly ready—these are now being pushed forward.
Primary checking of Storm Warnings, 1894.—Done to date.
Checking of 8.30 p.m. Forecasts.—Done to date.
Hay Harvest Forecast, 1894.—Checking one half done.
Quarterly Weather Report, 1881.—Third quarter well in hand.
Quarterly Weather Report, 1882.—Revision of Tables and Maps, nearly completed.
Rainfall Publication, Part I.:—

Copy sent to printers—in all	240	stations.
Revised and sent "for press"	133	„
Balance in hand of printers	107	„

(Signed) FREDC. GASTER.

Telegraphic Branch,
December 12, 1894.

PANTAGRAPH ROOM.

December 1, 1894.

The proof sheets of the Tables of Hourly Means for 1891 have all been read and signed for press; the Appendix, consisting of mean hourly sunshine values for the seven observatories, is now in the hands of the printer

The tables of mean values for 1892 are still in hand, but the work is in a forward state.

A discussion of the results obtained from the hourly measurements of sunshine cards for the seven observatories is also in hand.

The routine work of the room has occupied a good deal of time, as also have several matters connected with the Bridled and other anemometers.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

December 1, 1894.

Examinations.

January–November, 1894:—Proceeded with.
Weekly examination (on receipt) of Curves and Documents from all Observatories.

Miscellaneous.

Diary of Operations, 1895:—Preparation of, and correction of proofs of the same.
Revising and correcting proof of Form No. 32. (Register of Weather Sheet.)
Diurnal Range of Rainfall, 1871–80:—Examination and correction of the hourly values proceeded with.

(Signed) T. E. ALLEN.

E 81252.

Submitted.—The following list of publications which had been received since the last meeting :—

Magdeburg.—Jahrbuch der meteorologischen Beobachtungen der Wetterwarte der Magdeburgischen Zeitung. Bd. xii., 1893.
Mill, H. R.—The Clyde sea area. Part iii. Distribution of temperature.
Lloyd's Seaman's Almanac.—1895.
Tacubaya, Observatorio Astronomico Nacional.—Anuario. Año xv. 1895.

63, *Victoria Street, January* 9, 1895.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN.	MR. GALTON.
PROFESSOR DARWIN.	MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (December 12, 1894) were read and confirmed.

Mr. Scott reported that on the 15th instant he had received the following letter :—

(M.O. 2207.)

The Royal Society,
Burlington House, London, W.,
December 14, 1894.

DEAR SIR,

I AM directed by the President and Council of the Royal Society to ask the advice of the Meteorological Council on the enclosed communication from the Imperial Russian Geographical Society. The President and Council would be glad if the Meteorological Council would prepare for them such an answer as they think should be sent to this communication. I may mention that the Hydrographer of the Admiralty has expressed to the President and Council an unfavourable opinion on the project.

Yours, &c.
(Signed) M. FOSTER,
Secretary, R.S.

The Secretary,
Meteorological Council,
63, Victoria Street, S.W.

He further reported that, acting under instructions from the Chairman, he had forwarded a reply as follows :—

P.C. 2243.
(M.O. 2207.)

Meteorological Office,
63, Victoria Street, London, S.W.,
December 31, 1894.

DEAR SIR,

I AM instructed to inform you that a communication identical with that enclosed in your letter of the 14th instant reached the Meteorological Council on the 23rd of June last.

The matter was considered at their meeting of 11th July, and, in accordance with their instructions, a letter, of which a copy is appended, was forwarded to Admiral Makaroff.

The papers enclosed in your letter are now returned.

Yours, &c.
(Signed) ROBERT H. SCOTT,
Secretary.

The Secretary,
Royal Society.

Read—Letter No. 61, from the Royal Geographical Society requesting that the Council would join with other scientific societies in advocating the undertaking of an Antarctic Expedition.

The Secretary was instructed to draft a reply.

Submitted—The correspondence *re* aneroid testing (Minutes, p. 71). The Secretary was instructed to put this in the form of a report, to be subsequently entered on the Minutes.

Mr. Scott reported that he had learnt that the aspirator air pump, purchased in 1885 at the cost of 46*l.* for the experiments on fog by Dr. W. J. Russell, F.R.S., was now lying at University College (Minutes, 1890, p. 36), (Letter 2228/94), and he submitted a letter (No. 52) from Dr. Russell on the subject. He was instructed to ascertain if the apparatus could be utilized at Kew Observatory (P.C. 71).

The Secretary drew attention to the Minute relative to the payment for observations at St. Helena (Minutes, 1891, p. 46), in which it stated that the arrangements were to be reconsidered in three years. He submitted the following list of records received.

MEMORANDUM.

RETURNS received from ST. HELENA.

January 11, 1895.

Our present station at St. Helena was established in the beginning of 1892 (see Minutes, 1891-2, page 46). It is situated on the hill, about 1,900 feet above the sea, and is under the care of Mr. S. H. Hands, the son of the chaplain of the Island.

The returns sent to the Meteorological Office are—

1°. The daily anemograms.

2°. Monthly returns, on form No. 19.

3°. Reports as to rollers.

1°. The anemographic record dates from February 11, 1892, and continues to the present time, but with serious *lacunæ*, owing mainly to the difficulty experienced by the observer in getting the clock to work properly.

The gaps amount to 94 days in 1892,
" 195 " " 1893,
" 148 " " 1894,
or about three-sevenths of the whole period.

2°. The monthly return, on Form 19, includes observations taken at 9 a.m. each day, of barometer, dry-bulb and wet-bulb thermometers, maximum and minimum temperatures, rainfall, wind, and cloud. This record began on February 1st, 1892, and is continuous to date.

3°. Records of rollers. One report on this subject has been received, that namely for 1893.

R. H. Scott, Esq. (Signed) JOHN A. CURTIS.

It was resolved that the arrangements be continued for a further period.

Read—A memorandum from Mr. Baillie reporting that since last meeting eight logs had been received, three of them being " excellent." Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The Signals were hoisted on nine days, the total number of districts warned being 68.
In 57 districts the warnings were justified.

GALE EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

A strong gale from N.W. over the Shetlands and Caithness on December 26—apparently due to a small disturbance, secondary to a larger system over Scandinavia. Of these secondaries we get, as a rule, no indications beforehand.

Telegraphic Branch, (Signed) FREDC. GASTER.
January 9, 1895.

Read—Letter 40 from Mr. Canham (Minutes, 1892, p. 66) reporting his recovery and requesting to be re-employed. Mr. Scott was authorised to offer him temporary employment at 10*d.* per hour on similar terms to those of Civil Service writers. Mr. J. Curtis to report on his work at the end of a month.

Reported that :—

January 1, 1895.

The following instruments have been ordered for stock on M.O. account to meet demands :—

	£	s.	d.
6 maximum thermometers	4	16	0
6 minimum do.	4	13	0
6 radiation do.	3	12	0
6 ordinary do.	2	5	0
6 solar do.	5	11	0

A supply of thermometer-screens is required for use on board merchant ships.

To R. H. Scott, F.R.S. (Signed) R. STRACHAN.

—Approved.

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of December 1894:—

The letters used have the following signification :—

a = complete success. | **c** = partial failure.
b = partial (*i.e.*, more than half) success. | **d** = total failure.

DECEMBER.

Districts.		Per-centages.			Per-centage of Success. a + b.
		Wind.	Weather.	Average Forecast.	
Scotland, N.	a	45	55	50	78
,,	b	24	31	28	
,,	c	14	7	10	
,,	d	17	7	12	
Scotland, E.	a	52	69	61	83
,,	b	21	24	22	
,,	c	17	7	12	
,,	d	10	0	5	
England, N.E.	a	54	53	54	84
,,	b	23	37	30	
,,	c	13	10	11	
,,	d	10	0	5	
England, E.	a	54	47	51	87
,,	b	30	43	36	
,,	c	3	7	5	
,,	d	13	3	8	
Midland Counties	a	50	40	45	81
,,	b	27	44	36	
,,	c	13	13	13	
,,	d	10	3	6	
England, S.	a	60	53	57	90
,,	b	30	37	33	
,,	c	3	7	5	
,,	d	7	3	5	
Scotland, W.	a	48	69	59	80
,,	b	21	21	21	
,,	c	21	7	14	
,,	d	10	3	6	
England, N.W.	a	43	70	57	82
,,	b	27	23	25	
,,	c	17	0	8	
,,	d	13	7	10	
England, S.W.	a	54	67	61	79
,,	b	23	13	18	
,,	c	10	10	10	
,,	d	13	10	11	
Ireland, N.	a	47	47	47	79
,,	b	27	37	32	
,,	c	16	6	11	
,,	d	10	10	10	
Ireland, S.	a	43	47	45	84
,,	b	30	47	39	
,,	c	17	0	8	
,,	d	10	6	8	
Summary.					
British Isles	a	50	56	53	82
,,	b	26	32	29	
,,	c	13	7	10	
,,	d	11	5	8	

Submitted—The following reports of work during the month of December 1894:—

MARINE BRANCH.

January 5, 1894.

Examined seven new logs.

Completing the preparation of the monthly charts, showing the wind, barometer, air temperature, and weather results for the district between the Cape of Good Hope and New Zealand; also making progress with the monthly charts of currents and sea temperature for the same area.

Advancing the preparation and extraction of the data for the region south of the Equator between the longitudes of 10° E. and 90° W.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) DEPARTMENT.
(To 31st December 1894.)

Weekly Weather Report, 1894.—All numbers issued to date. Appendices well advanced; Monthly Summaries issued to end of October; November is in press, and well advanced.

Daily Weather Report.—All numbers promptly issued.

Primary Checking of Storm Warnings, 1894.—Done to date.

Checking of 8.30 *p.m. Forecasts*, 1894.—Done to date.

Hay Harvest Forecasts, 1894.—Checking finished. Summary is in course of preparation.

Quarterly Weather Report, 1881.—Third quarter; in progress.

Rainfall Publication.—Part I. Proof received for 96 stations, and same is nearly revised. Preparation of about 60 new stations well advanced.

(Signed) FREDC. GASTER.

Telegraphic Branch,
January 1895.

PANTAGRAPH ROOM.

January 1, 1895.

Progress has been made with the Tables of Mean Values for 1892; and a beginning has been made with the calculation of the means required for the Kew Annual Report. This latter work has been carried as far as tabulations are available, and now awaits a further supply of sheets from the Examination Room. A good deal of time has been occupied in the discussion of the means obtained from the hourly tabulations of sunshine curves. The printing of the Appendix to the volume of Hourly Means for 1891 has been delayed mainly on account of this discussion.

The routine work of the Room has been kept up to date.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

January 1, 1895.

Examinations.

January–December 1894.—Proceeded with.

Weekly examination (on receipt) of curves and documents from all observatories.

Miscellaneous.

Glasgow Scale and Zero-Line Values.—Measurements, &c. for the determination of the.

Investigations, &c., *re* differences between the totals of rainfall by the Beckley gauge as shown by the trace and measured in glass at Fort William.

Examining and cutting rain-gauge forms to size for the printers.

General routine work.

(Signed) T. E. ALLEN.

Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on the 11th December 1894 - -	2,457	13	7
Receipts from 12th December to 8th January - -	4,864	4	0
	7,321	17	7
Cheques drawn from 12th December to 8th January -	1,592	15	3
Balance on 8th January - - - -	£5,729	2	4

Mr. Scott reported (Minutes, p. 37) that Mr. R. Curtis had stated that the recording portion of the Holyhead anemograph required renewal, and he submitted a letter (No. 2153/94) from Mr. Munro estimating the cost of repairing portions of the old Stonyhurst anemograph, for use at Holyhead, at 19*l.* 17*s.*

This expenditure was authorised.

Submitted—The following list of publications which had been received since the last meeting:—

Azambuja, G. A. de. Annuario do Estado do Rio Grande do Sul para o anno de 1895.

Rome, Specola Vaticana. Pubblicazioni. Vol. iv.

Woeikof, A. Klimatologische Zeit. und Streitfragen. I. Bemerkungen über den Einfluss von Land und Meer auf die Lufttemperatur. iv. Sind die Winter im Norden wärmer geworden? v. Kontinentales und ozeanisches Klima. vi. Abhängigkeit der Regen von der Aenderung des Querschnittes der Luftströme.

—— Klimaschwankungen, resp. mehrjährige Perioden der Witterung und ihre Erforschung.

—— Bodentemperatur unter Schnee und ohne Schnee in Katherinenburg am Ural.

—— Das Klima und die Kultur.

—— Gefrieren des Hudsonflusses in Albany, Vereinigte Staaten.

—— The radical differences in the climate of Russia as compared with other countries, and especially with North America. The influence of the climate on the propagation of cultivated plants, and on the duration of vegetation. Methods of collecting meteorological data.

—— Mehrjährige Schwankungen der Tiefentemperaturen des Genfersees und anderen Seen und Binnenmeere wärmerer Gegenden.

—— Regenfall des südwestlichen Transkaukasien.

—— Der tägliche Gang der Temperatur und der Hydrometeore in Nordindien.

Stuttgart, Meteorologische Centralstation. Deutsches meteorologisches Jahrbuch. Jahrg. 1893. Meteorologische Beobachtungen in Württemberg.

Kassner, C. Ueber einen vermutheten Zusammenhang zwischen Wolkenwogen und Niederschlägen.

Utrecht, Koninklijk Nederlandsch Meteorologisch Instituut. Onweders in Nederland. Deel. xiv., 1893.

Buenos Ayres, Oficina Meteorológica Argentina. Anales. Tomo. ix. Partes 1–2.

Rotch, A. L. Meeting of the International Meteorological Committee [at Upsala].

—— The Meteorological Services of South America.

Sydney Observatory. Results of meteorological observations made in New South Wales in 1890.

—— —— Results of rain, river, and evaporation observations made in New South Wales during 1892.

Zürich, Schweizerische Meteorologische Central Anstalt. Annalen. 1892.

Hunt, H. A. An essay on Southerly Bursters.

Pesth, Königl. Ung. Central Anstalt für Meteorologie und Erdmagnetismus. Jahrbücher. xxi. Bd., Jahrg. 1891.

Dewar, D. Atmospheric tendencies, mean velocity and probable weather, 1895.

Batavia, Observatorium. Regenwaarnemingen in Nederlandsch-Indië. xv. Jahrg. 1893.

Copenhagen, Institut Météorologique de Danemark. Observations Internationales Polaires. 1882–83. Expédition Danoise. Observations faites à Godthaab. Tome I. Livr. 2.

Bombay, Meteorological Office. Brief sketch of the meteorology of the Bombay Presidency in 1893–4.

Krasno, Neutrathaler Agrarmeteorologisches Observatorium. Grafische Darstellung des Temperaturverlaufes während der letzen 20 Winter, 1873–93.

63, *Victoria Street, January* 23, 1895.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN. | PROFESSOR DARWIN.

MR. STONE.

The Secretary was in attendance.

The Minutes of the last meeting (January 9) were read and confirmed.

The subjoined draft reply to the Royal Geographical Society (Minutes, p. 74) was adopted:—

DEAR SIR,

I AM instructed by the Meteorological Council to inform you, in reply to your letter of the 7th instant, that while they fully recognise the value to meteorological science of observations such as might be procured by means of an Antarctic expedition, they are of opinion that it is hardly consistent with the duties which the Council has to discharge, for them to join in advocating such an undertaking in the manner suggested by the Royal Geographical Society.

I am, &c.

Clements R. Markham, Esq., C.B., F.R.S., &c. &c. (Signed)

Read—Letter 88 from Mr. Chree, stating that probably the air pump (Minutes, p. 75) would be found useful at Kew. Mr. Scott was directed to ascertain its capabilities.

Read—A memorandum from Mr. Baillie, stating that six logs had been received since last meeting, four of them being "excellent." Mr. Scott was instructed to present the charts (O. 59) to Capt. Dulling, SS. "Strathclyde," and to convey the best thanks of the Council to the other observers.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council:—

WARNINGS ISSUED.

The signals were hoisted on 6 days, the total number of districts warned being 33.
In 26 districts the warnings were justified.
In 2 „ doubtful, but in all probability justified.

GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,
23 January 1895.

Read—Letter 85 from the Imperial Institute, asking the Council to co-operate in the forthcoming exhibition of photography. Mr. Scott was instructed to reply that the co-operation of Kew Observatory, which the Council understood would be assured, would embrace all the exhibits they could supply. (P.C. 160.)

Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 8th January - - -	5,729	2	4
Receipts from 9th to 22nd January - - -	20	3	8
	5,749	6	0
Cheques drawn from 9th to 22nd January -	200	19	9
Balance on 22nd January - - - -	£5,548	6	3

Submitted—The following statement of accounts for the nine months ending 31st December 1894:—

Receipts.	£ s. d.	£ s. d.	Payments.	£ s. d.	£ s. d.
Balance from year 1893–94	- - -	1,517 12 11	Administration:		
Proportion of vote -	- - -	10,500 0 0	Secretary - -	600 0 0	
Repayment of expenses charged under—			Salaries and wages -	668 8 3	
(1.) Incidental expenses	1 13 7		Rent, fuel, and lighting	523 14 3	
(2.) Observatories -	27 14 0		Furniture and fittings	*73 11 5	
		29 7 7	Incidental and contingent expenses -	135 15 11	
			Pensions - -	123 3 3	
Supply of Weather Information:			International Meteorological Congress, expenses incidental to - - -	26 4 8	2,150 17 9
D.W. Charts and Forecasts - -	195 13 7		Special Researches:		
6 p.m. Charts - -	18 15 0		Salaries and other charges - -	- - -	*514 18 2
Information for Press Agencies, &c.	60 12 4		Land Meteorology:		
Telegrams - -	71 5 10		Observatories and stations - -	1,675 17 6	
		346 6 9	Discussion and reduction of observations -	1,199 5 6	2,875 3 0
Sale of Instruments, &c.:			Weather Information and Forecasts:		
M.O. account - -	17 14 5		Telegraphic reports and storm warnings	1,849 7 8	
Royal Navy account -	4 11 2		Preparation and issue of reports and forecasts - -	1,396 15 7	3,246 3 3
Mercantile Marine account - -	9 4 0		Inspections:		
		31 9 7	Salaries and travelling	- - -	395 11 5
Miscellaneous Commissions - -	- - -	17 11 6	Ocean Meteorology:		
Commission charged on work done for Colonies, &c. - -	- - -	2 17 4	Discussion and reduction of observations -	1,193 10 0	
			Expenses incidental to the supply of instruments:		
			Proportion for care and issue of instruments -	150 0 0	
			Royal Navy -	*772 1 9	
			Mercantile Marine	123 17 9	
			Distant island and coast stations	7 10 0	2,246 19 6
			Miscellaneous Commissions - -	- - -	34 0 0
			Balance:		
			Cash at Bank -	922 11 8	
			„ at Office -	59 0 11	981 12 7
		£12,445 5 8			£12,445 5 8

Liabilities.	£ s. d.	Assets.	£ s. d.
To Council - - - -	750 0 0	By H.M. Exchequer - - -	975 0 0
„ Post Office (partly estimated) -	330 0 9	„ cash at Bank - - -	922 11 8
„ sundry creditors - - -	484 6 11	„ „ at Office - - -	59 0 11
„ balance - - -	546 3 0	„ sundry debtors - - -	153 18 1
	£2,110 10 8		£2,110 10 8

* Some expenses under these heads not yet brought to account.

Reported—That the cash accounts for the quarter ended the 30th September last had been audited on the 22nd instant, by the Chairman and Dr. Buchan, and would be sent in due course to the Treasury for the Audit Office. The receipts for the quarter amounted to 3,650*l.* 0*s.* 6*d.*, and the payments amounted to 3,351*l.* 3*s.* 6*d.*, leaving a balance of 1,403*l.* 18*s.* 10*d.* in hand and at the bank on the 1st October 1894, as against 1,832*l.* 12*s.* 11*d.* on the 1st October 1893.

Submitted—The following list of publications which had been received since the last meeting :—

Zürich, Schweiz. Departement des Innern.—Graphische Darstellung der schweizerischen hydrometrischen Beobachtungen, 1894.

Trabert, W.—Zur Theorie der elektrischen Erscheinungen unserer Atmosphäre.

Vienna, K. K. Central Anstalt für Meteorologie, &c.—Täglicher Gang des Barometers zu Port au Prince nach zweijährigen Beobachtungen 1890–92 des Herrn Professors P. Josef Scherer, nebst einer Übersicht der bisherigen Beobachtungs-ergebnisse zu Port au Prince 1865–69, von Prof. A. Ackermann und 1888–93 von Prof. J. Scherer.

Prague, Technisches Bureau des Landesculturrathes für das Königreich Böhmen.—Ergebnisse der Wasserstandsbeobachtungen an den Flüssen Böhmens für das Jahr 1893.

—— —— Ergebnisse der ombrometrischen Beobachtungen in Böhmen für das Jahr 1893.

Tiflis, Physikalisches Observatorium.—Beobachtungen, 1892.

Vienna, Kais. Akademie der Wissenschaften.—Berichte der Commission für Erforschung des Östlichen Mittelmeeres. Dritte Reihe.

Clements, H.—Forecasts for 1895.

Mellish, H.—The weather of 1894, at Hodsock Priory, Worksop.

Jackson, R.—Ocean passages compiled from the various Sailing Directions.

——. The principal Winds and Currents of the globe : also rainy seasons, ice limits, fogs, and rollers and revolving storms.

63, *Victoria Street, February* 6, 1895.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. GALTON. | MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (January 23) were read and confirmed.

The subjoined draft report on the subject of aneroid testing (Minutes, p. 74), with a letter from Mr. Chree thereon, was ordered to be printed:—

DRAFT REPORT.

The Committee report that the present method of testing aneroids at Kew Observatory is as follows:—

"For instruments for the M.O. the pressure is reduced inch by inch from 30 to 26 inches, the operation of lowering the pressure occupying three or four minutes per inch, and the readings being taken at each inch, the instruments being in the vertical position, pendant up.

"The aneroids are also tried at the ordinary atmospheric pressure, at temperatures of about 35°, 60°, and 95° F.

"Rejection takes place if, in the first test, the error observed at any point exceeds 0·05 inch, or if, in the temperature test, a difference greater than 0·05 inch is observed between the readings,—referring to the same barometrical pressure,—at any two of the three temperatures.

"The ordinary test differs, in that the readings are taken with ascending as well as descending pressures, the instrument being in a horizontal position. Unless specially asked to fix a standard, none are rejected except for instrumental defect or serious error, but the receivers of the certificates are allowed to draw their own conclusions from the data supplied."

Your Committee would recommend:—

I. That the compensation for temperature should be examined, and that there should be a comparison, at atmospheric pressure only, at about 35° and 95° F., the results to be entered on the certificate.

II. The aneroids to be examined at one pressure only:—
   a. In a horizontal position.
   b. With pendant up.
   c. With pendant horizontal.

III. Columns to be given for readings at every inch, from 31 to 26 inches, in horizontal position only.

IV. Aneroids may be deemed to be sufficiently accurate if the reading at any point examined between 31 and 26 inches does not differ more than 0·030 inch from that of the standard barometer.

(Signed) ROBERT H. SCOTT.

Kew Observatory, Richmond, Surrey,
January 14th, 1895.

As to the recommendations:—

I. I think the *results* that should be entered are the differences from the reading at 60° approx. of the readings at about 35° and 95° respectively; if merely the difference between the readings at 35° and 90° is given one would be in considerable uncertainty how to apply a correction..

II. Are the differences observed to be entered on the certificate, and is any use to be made of them? At present I should suggest that the differences be recorded and that an aneroid be rejected if the difference is such as to suggest instrumental defect, but that no attempt be made to assign a definite standard until a stock of data has been accumulated. I doubt whether trial with pendant horizontal should not be made both with pendant right and pendant left. A trial here gave a difference of 0·05 inch in the readings in these two positions, the difference from pendant vertical being 0·1 inch in one of the two positions. The pressure when comparison made had better be noted

III. It is not stated whether readings are to be taken both with descending and ascending pressures or not. In our usual test we start say at 30, go down to 26, rise inch by inch to 30, and then blow up pressure to 31 and let it down again to 30. What we take as the error at 31 is not the error observed but that outstanding when the reading at 30 in the final states is corrected to its initial value. The object is to arrive at what the error at 31 might have been expected to be if no after-effect existed from previous subjection to the low pressures. Perhaps the approximate temperature should be stated, so as to render results under I. more applicable.

IV. Supposing that readings are to be taken with pressure ascending, is the limit 0·03 inch to apply to such readings or only to those with pressure descending? If it applies to both ascending and descending readings few aneroids will, I suspect, pass.

Yours, &c.
(Signed) CHARLES CHREE.

NOTE BY REAR-ADMIRAL WHARTON.

In my opinion it will be sufficient to apply to aneroids for naval service the following tests :—

Temperature Test.

Test at 35°, 60°, and 95° F. in suspended position.
Reject if the difference of reading at any two of these temperatures exceeds 0 · 05 in.

Position Test.

Test with aneroid horizontal and suspended at atmospheric pressure.
Reject if the difference of the two readings exceeds 0 · 05 in.

Test for Scale Errors.

Test at every inch from 31 to 26 inches, pressure descending, allowing five minutes between each fall of an inch.

Reject if difference of error of original reading, compared with standard at barometric pressure, from corresponding error of any subsequent reading, exceeds 0 · 05 in.

Test for return to Atmospheric Pressure.

Allow pressure to rise again to atmospheric pressure, occupying the same time as in descending, and after an interval of two hours, take a reading. Reject if the difference of this reading from the original reading, making allowance for any change of atmospheric pressure in the interval, exceeds 0 · 05 in.

(Signed) W. J. L. WHARTON.

7th February 1895.

Mr. Scott was instructed to communicate the above regulations to the instrument makers from whom aneroids are obtained, and to say that certificates from Kew that these tests have been complied with, will be required for all aneroids purchased in future by the Council for the Royal Navy.

Submitted—The following :—

RETURN of STOCK of "A" INSTRUMENTS at HER MAJESTY'S DOCKYARDS and in the OFFICE.

Place and Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Meteorological Office, October 1st, 1894, to January 1st, 1895.	Available	16	28	50	56	51	15
	Received, new	—	—	120	—	—	36
	„ repaired, cleaned, &c.	39	19	34	9	14	—
	Total	55	47	204	65	65	51
	Issued	24	40	74	22	22	4
	Total Available	31	7	130	43	43	47
Portsmouth, January 1st, 1895.	Establishment	23	53	150	50	50	25
	In Store	22	54	150	50	50	27
	Deficiency	1	—	—	—	—	—
Devonport, January 1st, 1895.	Establishment	22	50	140	45	45	22
	In Store	20	46	141	34	40	19
	Deficiency	2	4	—	11	5	3
Chatham, January 1st, 1895.	Establishment	18	54	120	35	35	25
	In Store	15	40	82	28	33	22
	Deficiency	3	14	38	7	2	3
Sheerness, January 1st, 1895.	Establishment	6	22	40	15	15	10
	In Store	6	18	34	13	14	10
	Deficiency	—	4	6	2	1	—

Date.	Particulars.	Barometers.		Thermometers.			
		Mercurial.	Aneroid.	Ordinary.	Max.	Min.	Screens.
Jan. 1st 1895 -	Establishment at Meteorological Office.	45	120	250	80	80	50
„ -	In Stock - - -	31	7	130	43	43	47
„ -	Ordered - - -	30	110	120	60	40	—
„ -	Repairing - - -	1	14	—	—	—	—
„ -	Excess - - - -	20	11	—	23	3	—
„ -	Defect - - - -	—	—	—	—	—	3
	At Dockyards—Home :						
„ -	Portsmouth, defect - -	1	—	—	—	—	—
„ -	Devonport „ - -	2	4	—	11	5	3
„ -	Chatham „ - -	3	14	38	7	2	3
„ -	Sheerness „ - -	—	4	6	2	1	—
„ -	Total defect - - -	6	22	44	20	8	6
	At Dockyards—Abroad :						
„ -	Queenstown, defect - -	1	—	—	—	—	—
„ -	Gibraltar „ - -	—	—	—	—	—	—
„ -	Malta „ - -	3	9	11	5	—	—
„ -	Bombay „ - -	—	1	8	1	1	—
„ -	Halifax „ - -	2	1	—	—	—	1
Oct. 1st, 1894	Bermuda „ - -	—	—	—	—	—	—
Jan. 1st, 1895	Jamaica „ - -	—	—	—	—	—	—
„ -	Cape Good Hope. „ - -	1	—	—	—	—	—
„ -	Trincomalee „ - -	—	—	—	—	—	—
Oct. 1st, 1894	Hong Kong „ - -	7	4	10	4	—	2
Jan. 1st, 1895	Coquimbo „ - -	—	—	—	—	—	—
Oct. 1st, 1894	Sydney „ - -	—	1	6	1	2	—
Jan. 1st, 1895	Esquimalt „ - -	—	—	—	—	—	—
	Total defect - - -	14	16	35	11	3	3
	Nett deficiency - -	—	27	79	8	8	12

(Signed) R. STRACHAN.

6th February 1895.

Submitted—The following as the result of the Primary Checking of the Storm Warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on six days, the total number of districts warned being 34. In 31 districts the warnings were justified.

GALES EXPERIENCED, BUT FOR WHICH NO WARNINGS WERE ISSUED.

None.

FREDC. GASTER.

Telegraphic Branch,
6th February 1895.

Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 22nd January - - -	5,548	6	3
Receipts from 23rd January to 5th February -	51	8	4
	5,599	14	7
Cheques drawn from 23rd January to 5th February	962	12	7
Balance on 5th February - - -	£4,637	2	0

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of January 1895 :—

The letters used have the following signification :—

a = complete success. | **c** = partial failure.
b = partial (*i.e.*, more than half) success. | **d** = total failure.

JANUARY.

Districts.		Per-centages. Wind.	Weather.	Average Forecast.	Per-centage of Success a + b.
Scotland, N.	a	36	61	49	84
"	b	35	36	35	
"	c	26	3	15	
"	d	3	0	1	
Scotland, E.	a	45	71	58	85
"	b	23	26	25	
"	c	26	3	14	
"	d	6	0	3	
England, N.E.	a	58	74	66	89
"	b	23	23	23	
"	c	16	3	10	
"	d	3	0	1	
England, E.	a	49	58	54	88
"	b	32	36	34	
"	c	16	6	11	
"	d	3	0	1	
Midland Counties	a	33	55	44	78
"	b	32	35	34	
"	c	32	10	21	
"	d	3	0	1	
England, S.	a	39	65	52	88
"	b	42	29	36	
"	c	13	6	9	
"	d	6	0	3	
Scotland, W.	a	26	45	36	71
"	b	39	32	35	
"	c	29	7	18	
"	d	6	16	11	
England, N.W.	a	42	71	57	84
"	b	36	19	27	
"	c	16	0	8	
"	d	6	10	8	
England, S.W.	a	52	61	57	83
"	b	29	23	26	
"	c	10	6	8	
"	d	9	10	9	
Ireland, N.	a	55	65	60	83
"	b	26	19	23	
"	c	10	3	6	
"	d	9	13	11	
Ireland, S.	a	39	71	55	83
"	b	39	16	28	
"	c	9	13	11	
"	d	13	0	6	

SUMMARY.

British Isles	a	43	63	53	83
"	b	32	27	30	
"	c	19	6	12	
"	d	6	4	5	

Some accounts, forwarded from Kew Observatory for payment, were submitted. The Secretary was instructed to write to the Superintendent to say that the Office will bear the cost of disbursements "out of pocket," but not the value of assistant's time, unless it shall have been previously arranged by the Council how such charges shall be met. (P.C. 278.)

Submitted—A memorandum by Mr. Baillie stating that since last meeting three logs had been received, all of them being "excellent." Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Submitted—The following reports of work during the month of January 1895 :—

MARINE BRANCH.

February 5th, 1895.

Examined 11 new logs.

Preparing the final charts showing the monthly results obtained for the various elements discussed in the area between the Cape of Good Hope and New Zealand.

Advancing the preparation and extraction of the meteorological data contained in Office logs for the district south of the equator, extending from the West Coast of Africa to the longitude of 90° W.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.
(To 31st January 1895.)

Weekly Weather Report, 1894.—Monthly Summary for *December* is in the press ; Title-page and Preface, with Tables of Errata, &c., has been carefully revised and will be ready for press as soon as the December Summary is in. Appendix I., Parts 4 and 5, and Appendix II. have been published.

Weekly Weather Report, 1895.—All numbers issued promptly to date.

Daily Weather Report, 1895.—All numbers issued promptly.

Extraction of Absolute Maxima and Minima of temperature for each telegraphic reporting station in each month from 1871 onwards. (For insertion as standing matter in the Daily Weather Report.) About one-third done.

Primary checking of Storm Warnings, 1895.—Done to date.

Checking of Forecasts, 1895.—Done to date.

Hay Harvest Forecasts, 1894.—Checking completed.

Rainfall Publication :—

Part I.—The whole of the information for England (96 pages = 287 stations), is either printed off, or in type and revised. I am now pushing on with the Scotch stations, so as to send a large quantity to printer as soon as the type is free.

Part II.—The values for the English stations are all ready to go to printers, and those for the Irish stations are in hand.

Quarterly Weather Report, 1881.—In progress.

The taking of the Christmas (1894) holidays has now been completed.

I have been two days in a law court to give evidence in case of Gregory *v.* Gregory.

(Signed) FREDC. GASTER.

6th January 1895.

PANTAGRAPH ROOM.

February 1st, 1895.

Hourly Means.

The discussion of the means obtained from the tabulation of ten years sunshine values has been completed; the form in which the tables are to be printed has been settled, and the whole of the "copy" is now with the printer. The means for the volume for 1892 have been advanced somewhat, but the preparation of the Kew Mean Values for 1894 has claimed most attention; the latter are finished to the end of September, and I am again waiting for tabulations from the Examination Room.

I have begun to arrange in convenient form the hourly mean values of pressure and temperature for the years 1869–1888 recently computed.

The routine work of the room has been kept up to date, but anemometry has taken up much more time than usual this month.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

February 1st, 1895.

Examinations.

January–December, 1894.—Proceeded with; Kew and Valencia records completed.
Weekly examination (on receipt) of curves and documents from all Observatories.

Reports.

January–December, 1894.—Copies of "Notes of Errors" to Kew.
October–December, 1894.—Copies of "Notes of Errors" to Valencia.
Glasgow, Thermograph, Scale, and Zero Line Values.—Measurements, &c., for the determination of the, proceeded with.

Miscellaneous.

General routine work, and instruction of G. H. Bolton.

(Signed) T. E. ALLEN.

Submitted—The following list of publications, which had been received since the last meeting:—

Dufour, C.—La scintillation des étoiles.
London, General Register Office.—Fifty-sixth Annual Report of the Registrar General of Births, Deaths, and Marriages in England, 1893.
Madrid, Observatorio.—Observaciones meteorologicas efectuadas en el Observatorio de Madrid durante los años, 1892–1893.
Mathiesen.—Les courants de la mer et leur origine.
Buchanan, J. Y.—Sur la densité et l'alcalinité des eaux de l'Atlantique et de la Méditerrannée.
Eliot, J.—Instructions to observers of the India Meteorological Department.
Johnstone, R.—Jamaica rainfall, for the year 1893.
Kiel, Kommission zur wissenschaftlichen Untersuchung der deutschen Meere in Kiel und der Biologischen Anstalt auf Helgoland. Wissenschaftliche Meeresuntersuchungen. Neue Folge, I. Band, Heft 1.

63, *Victoria Street, February* 20, 1895.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

MR. BUCHAN. | MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (February 6) were read and confirmed.

Mr. Scott reported that he had received an application (letter 341) from the Local Government Board relative to statistics of prolonged frosts since 1860, and that he had replied (P.C. 318) explaining what information he would be prepared to supply if required. A letter had been subsequently received stating that no special return would be required.

Resolved—That in future instrument makers should be required to supply instruments that have been verified at Kew, and that the fees would have to be paid by them, and not by the Meteorological Council as heretofore.

Read—Letter 197 from the Kew Observatory suggesting that a half fee on rejection should be charged against the makers, on all instruments failing to obtain certificates at Kew; such charges not having been made hitherto on instruments for the Meteorological Office.

Read—A report from Mr. Chree (letter 283) as to the pump formerly used on fog experiments (Minutes p. 74).

As it appeared from this report that the pump could not well be used at Kew Observatory, Mr. Scott was instructed to have it removed to the Meteorological Office, and to inform the officers of the Royal Society of the existence of such a pump, if required for investigations.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on six days, the total number of districts warned being 42. In 31 districts the warnings were justified, and about 3 there is uncertainty, owing to want of information.

GALES EXPERIENCED, BUT FOR WHICH NO WARNING WAS ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,
February 20, 1895.

Read—A Memorandum (letter 331) from Mr. R. Curtis as to the necessity for supplying a new drum for the Holyhead anemograph (Minutes p. 78). Sanctioned, expense to be 1*l.* 6*s.* 0*d.*

Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on February 5th - - - -	4,637	2	0
Receipts from February 5th to 19th - -	10	13	6
	4,647	15	6
Cheques drawn from 5th February to 19th - -	54	7	1
Balance on 19th February - - - - -	4,593	8	5

Submitted—The following list of publications, which had been received since the last meeting :—

Hann, J.—Der Regenfall auf den Hawaii-Inseln.

Rome, Ufficio Centrale Meteorologico e Geodinamico Italiano. — Annali. Vol. xii., 1890, Parte ii.

London, British Association for the Advancement of Science.—Report of the sixty-fourth meeting held at Oxford in August, 1894.

St. Petersburg, Physikalisches Central Observatorium.—Annalen. Jahrg : 1893, Theil 1.

Petella, G.—Massaua ed Assab. Saggio di topo-idrografia e climatologia comparate.

Dorpat, Kaiserliche livländische gemeinnützige und ökonomische Sozietät.—Bericht über die Ergebnisse der Beobachtungen an den Regenstationen, 1892, 1893.

Kaminskij, A.—Der jährliche Gang und die Vertheilung der Feuchtigkeit der Luft in Russland nach den Beobachtungen von 1871–1890.

British Honduras.—Annual report for 1893.

Chandler, A.—Abstract of meteorological observations made at Torquay during the year 1894.

Manchester, Sheffield and Lincolnshire Railway.—Monthly statement of rain fallen in the year ending 31st December, 1894.

Polis, P.—Die Gewitter Erscheinungen in Aachen am 27 August 1894.

Ithaca, New York State Meteorological Bureau.—Fifth annual report, 1893.

Prince, C. L.—The summary of a meteorological journal kept at Crowborough Hill, Sussex, 1894.

63, *Victoria Street*, *March* 6, 1895.

PRESENT:

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

PROFESSOR DARWIN. | MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (February 20) were read and confirmed.

Read—Letter 383 from the Meteorological Reporter to the Government of India, inquiring if, in the opinion of the Council, "the publication of the Monsoon Area "Weather Charts (Minutes, 1893, p. 33) is considered of sufficient interest and utility "to the meteorologists of Europe and America, and the commercial public in India, "to justify the extra expenditure their publication entails."

Mr. Scott reported that daily charts had been received for the period of 19 months, from January 1893 to July 1894, inclusive.

Mr. Scott reported that the air-pump (Minutes, p. 86) had been delivered at the office, and that the officers of the Royal Society had been notified of its existence, as directed at last meeting.

Read—A letter (No. 385) from the Crown Agents for the Colonies, offering for sale two Osler's anemometers and a transit instrument.—Declined (P.C. 406).

Read—A letter (No. 430) from Mr. Chree, inquiring if he was at liberty to forward a set of electrograms to Lord Kelvin.—Sanctioned (P.C. 398).

At the suggestion of the Chairman, it was decided to make arrangements for the erection of Dines' pressure tube anemometers at Scilly and at Holyhead.

Mr. Scott drew attention to the fact that there were at the office two disused Galton's pantagraphs and a copper-plate proving press. He was instructed to inform the officers of the Royal Society as to the pantagraphs, and to endeavour to sell the press.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council:—

WARNINGS ISSUED.

Telegraphic Branch,
March 6, 1895.

The signals were hoisted on 2 days, the total number of districts warned being 11. In 7 districts the warnings were justified.

GALES EXPERIENCED FOR WHICH NO WARNING WAS ISSUED.

None.

(Signed) FREDK. J. BRODIE,
For FREDC. GASTER.

Submitted—The following reports of work during the month of February 1895:—

MARINE BRANCH.

March 5, 1895.

Examined three new logs and three lighthouse registers.

Drawing monthly charts showing currents and sea temperatures for the district between the Cape of Good Hope and New Zealand.

Preparation and extraction of meteorological observations in Office logs south of the Equator, between the west coast of Africa and longitude 90° W.

Considering the coast lines of the charts to be used for the plotting of generalised currents for all oceans.

(Signed) CHAS. HARDING.

The Marine Superintendent.

Forwarded for the information of the Council.

(Signed) C. W. BAILLIE.

TELEGRAPHIC (FORECAST AND STORM WARNING) BRANCH.
(To 28th February 1895.)

Weekly Weather Report, 1895.—All numbers issued to date. Material for Appendices &c., being proceeded with.

Monthly Summary for January.—In hand.

Do. *do.* 1894.—December Summary, title page, preface, &c., all issued.

Daily Weather Report, 1895.—All numbers issued to date.

Do. *do.* 1894.—Monthly correction sheets. Issued to *July*. *August* at lithographer's. *September* well in hand.

Extraction of Extremes of Temperature recorded at each station during 25 years 1871–95.—Being proceeded with.

Rainfall Work, pages 49 to 96.—Ready to go for press.

(This comprises all the English and Welsh stations; the material for Scotch and Irish stations is in an advanced stage.)

There has been much illness in this Branch during the month:—

Mr. Brodie was absent eight days.
Mr. Rigby was absent six days.
Mr. Francis was absent two days.
Mr. Snell was absent nine days (illness and death of father).
Mr. Heinemann was absent four days.
Mr. Sawyer was absent eight days.

(Signed) FREDC. GASTER.

PANTAGRAPH ROOM.

March 1, 1895.

Hourly Means.—The Tables of Mean Values for 1892 are approaching completion. Proofs are now being received from the printer of the sunshine tables which form the appendix to the volume for 1891. A commencement has been made in the arrangement of the pressure and temperature means for the years 1869–90 with a view to their being combined and worked up.

Miscellaneous.—Two or three memoranda on the gales of last December have been prepared, with tracings of the anemograms. Dines' anemometer experiments have taken up rather more time than usual this month.

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

EXAMINATION BRANCH.

March 1, 1895

Examinations.

January 1894—*February* 1895.—Proceeded with.

Weekly examination (on receipt) of curves and documents from all observatories.

Miscellaneous.

Glasgow Thermograph Scale and Zero-line Values.—Measurements, &c., *re* the determination of the.—Proceeded with.

Fort William Barograph Scale Value.—Measurements, &c., *re* the determination of the.

Diurnal Range of Rainfall, 1871–1880.—Examination and correction of the hourly values proceeded with.

General routine work.

(Signed) T. E. ALLEN.

Submitted—The following statement of accounts:—

	£	s.	d.
Cash balance on 19th February - - -	4,593	8	5
Receipts from 20th February to 5th March -	10	4	0
	4,603	12	5
Cheques drawn from 20th February to 5th March	730	12	7
Balance on 5th March - - -	£3,872	19	10

Read—A memorandum by Mr. Baillie, stating that since the meeting on February 6 three logs had been received, two of them being "excellent."

Mr. Scott was instructed to convey the best thanks of the Council to the observers.

Submitted—The following list of publications, which had been received since the last meeting :—

Azambuja, G. A. de.—Annuario do Estado do Rio Grande do Sul. 1894.

London, Army Medical Department.—Report for the year 1893.

London, Meteorological Office.—Report of the Meteorological Council to the Royal Society for the year ending March 31, 1894.

Trieste, Osservatorio Astronomico-Meteorologico.—Rapporto annuale contenente le osservazioni meteorologiche di Trieste e di alcune altre stazioni Adriatiche per l'anno 1892. Vol. ix.

Hamburg, Deutsche Seewarte.—Resultate meteorologischer Beobachtungen von Deutschen und Holländischen Schiffen für Eingradfelder des nordatlantischen Ozeans. No. xiv. Quadrat 78.

Milan, R. Osservatorio Astronomico di Brera.—Osservazioni meteorologiche eseguite nell' anno 1894.

Angot, A.—Les aurores polaires.

London, Admiralty.—Sailing directions for the West Coast of Scotland: the Mull of Galloway to Cape Wrath, including the Hebrides or Western Islands. Fourth edition.

Constantinople, Observatoire Impérial.—Bulletin météorologique, 1894, contenant la liste des tremblements de terre survenus en Turquie en 1894.

Calcutta: Meteorological Office, Bengal.—Meteorological summary for the monsoon period of 1894.

63, *Victoria Street, March* 20, 1895.

PRESENT :

LIEUT.-GENERAL STRACHEY IN THE CHAIR.

DR. BUCHAN.	MR. GALTON.
PROFESSOR DARWIN.	MR. STONE.

THE HYDROGRAPHER.

The Secretary was in attendance.

The Minutes of the last meeting (March 6) were read and confirmed.

Read—Letter 517 from Mr. Cotton, C.E., as to the exposure of the Robinson anemometer at Holyhead, and the suggestions of Mr. R. H. Curtis on the subject in his Report. (Minutes, p. 37.)

Submitted—The following memorandum, which was ordered to be printed :—

March 19, 1895.

MEMORANDUM.

EXPOSURE of the ROBINSON ANEMOMETER at HOLYHEAD.

SIR,

IN thinking over the suggestion I made recently, that the velocity record of the Robinson anemometer at Holyhead was too low, in consequence of the deflection of the wind currents caused by the tower on which the instrument is placed, and by the buildings surrounding it, at a lower level, it occurred to me that if the supposition were correct some confirmation of it ought to be afforded by a comparison of the records with those of the bridled anemometer on Salt Island.

Assuming the supposition to be a correct one, I should expect the amount of difference between the two records to show—

(1) Some relation to the *force* of the wind.

(2) Some dependence upon the *direction* of the wind, since the obstructions around the base of the tower are distributed somewhat irregularly.

To see if this were so I have had measurements made of most of the bridled anemograms received since the instrument was cleaned last September, and have taken out the differences between them and the corresponding measurements of the Robinson curves, first correcting the latter to the factor 2·2. The measurements were grouped according to the velocity; *i.e.*, all those from 26 to 35 miles per hour were put together under 30; those from 36 to 45 miles per hour under 40; and so on. The results are shown in the following table :—

TABLE I.

Approximate Mean Velocity, in Miles per Hour.	Mean Difference, Bridled—Robinson.		Number of Observations.
	Miles per Hour.	Per-centage.	
30	+ 4·6	15	454
40	+ 7·6	19	249
50	+11·8	24	108
60	+17·8	30	30
70	+25·2	36	5

In this grouping no account was taken of the *direction* of the wind, which, as will be seen from the following Table exercises a considerable influence upon the result; and in order to make the figures in Table I. strictly comparable with each other, they ought, no doubt, to have been obtained in each case, from a similar distribution of winds around the compass.

The differences under each mean velocity were therefore re-arranged under eight points, to see what effect, if any, was due to the direction of the wind. The results are given in Table II.

TABLE II.

MEAN DIFFERENCE under each of EIGHT POINTS, and NUMBER of OBSERVATIONS.

Approximate Mean Velocity.	N.		N.E.		E.		S.E.		S.		S.W.		W.		N.W.	
30 -	4·8	45	3·1	86	5·1	93	3·2	40	2·3	124	8·4	27	12·6	28	12·7	12
Per cent.	16	—	10	—	17	—	11	—	8	—	28	—	42	—	42	—
40 -	3·9	57	3·8	30	4·8	12	3·3	9	4·2	40	11·3	37	15·7	31	11·9	33
Per cent.	10	—	10	—	12	—	8	—	11	—	28	—	39	—	30	—
50 -	7·6	18	6·0	1	—	—	8·0	1	4·2	6	15·7	18	18·0	17	10·9	47
Per cent.	15	—	12	—	—	—	16	—	8	—	31	—	36	—	22	—
60 -	—	—	—	—	—	—	—	—	16·0	1	23·5	4	20·1	9	15·1	16
Per cent.	—	—	—	—	—	—	—	—	27	—	39	—	34	—	25	—

Here the influence of the buildings surrounding the Lighthouse Tower is very clearly exhibited, and at the same time the increase of difference with increase of force is again brought out, although, owing to the small number of observations at high velocities and their entire absence for some points, the progression is not shown so uniformly as in Table I.

In the next table I have combined the differences for 30 and 40 miles, in order to get for each point a mean from a sufficient number of observations as would make it a fairly reliable one.

TABLE III.

MEAN DIFFERENCE under each of EIGHT POINTS, and NUMBER of OBSERVATIONS.

Mean Velocity.	N.		N.E.		E.		S.E.		S.		S.W.		W.		N.W.	
30 and 40 combined	4·3	102	3·3	116	5·0	105	3·3	49	2·8	164	10·0	64	14·2	59	12·1	45

I venture to submit that the results shown in this table prove conclusively:—

(1.) That the record yielded by the Robinson instrument is materially affected by its position.

(2.) That it is always too low.

(3.) That with strong winds blowing from between S.W. and N.W., somewhere about *two-thirds* only of the true velocity is recorded.

A further confirmation of these conclusions is yielded by the following comparison:—

During the violent gale of December 22nd last, by which my attention was specially called to the exposure of the Holyhead instrument, a very much higher velocity was recorded by the Robinson instrument at Fleetwood than at Holyhead; yet from various considerations it seemed pretty certain that the gale must have been equally severe at both places.

But if the corrections indicated by the above tables are applied to the Holyhead records, a remarkably close agreement between the two Robinson records, and also the bridled anemometer record, is obtained, as will be seen from the following table:—

TABLE IV.

—	Maximum Velocity in one Hour.	Corrected to Factor 2·2.	Corrected for Exposure.	Mean Velocity during Gale, 22 Hours.	Corrected to Factor 2·2.	Corrected for Exposure.
Fleetwood - -	107	78	78	79	58	58
Holyhead - -	71	52	78	57	42	60
Do. bridled -	—	—	79	—	—	59

(Signed) R. H. CURTIS.

R. H. Scott, Esq., F.R.S.

Mr. Scott submitted to the Council specimens of apparatus employed in England for observations on Earth Temperature, and he was instructed to ascertain what apparatus and methods were employed for determining this temperature by electrical thermometers.

Read—Letter No. 494 from Mr. Chree as to the arrangements for testing aneroids. The Chairman was requested to reply. (P.C. 511.)

Read—A memorandum by Mr. Baillie stating that since last meeting seven logs had been received, five of them being "excellent."

Mr. Scott was instructed to convey the marked thanks of the Council to the observers.

Submitted—The following report:—

HAY HARVEST FORECASTS, 1894.

Meteorological Office, Telegraph Branch,
March 19, 1895.

SIR,

I BEG to submit, herewith, the results of the checking of the Hay Harvest Forecasts issued in 1894.

The telegrams were sent daily, between 3.30 p.m. and 4 p.m., on each week-day, for the period of about five weeks, the issue commencing on the 11th June, and extending to other parts of the kingdom in the course of the ensuing three weeks.

The summary given in Table I. shows the general per-centage of success for the entire country was 89, or 2 per cent. lower than the previous year, the extremely unsettled conditions which prevailed during the summer of last year, when compared with the very settled weather of 1893, being sufficient to account for this slight falling off. The largest per-centage of success was 94 in England, E., next to which comes Scotland, N., and England, S., with 93 per cent. The smallest per-centage of success (82) was in Ireland, S.

In Table II. will be found the names and addresses of the various recipients, and also remarks testifying to the value and accuracy of the forecasts. In addition to the above there were telegrams sent to 12 gentlemen at their own cost, the number of these subscribers being much larger than in any previous year.

I am, Sir,
Your most obedient servant,
(Signed) FREDC. GASTER.

R. H. Scott, Esq., M.A., F.R.S.,

TABLE I.—SUMMARY of RESULTS.

Districts.	Names of Stations.	Per-centages.				Total Per-centage of Success
		Complete Success.	Partial Success.	Partial Failure.	Total Failure.	
SCOTLAND, N.	Munlochy and Golspie	60	33	7	—	93
SCOTLAND, E.	Rothiemay, Glamis, and Aberfeldy	56	34	10	—	90
ENGLAND, N.E.	Chatton	67	24	9	—	91
ENGLAND, E.	Rothamsted and Thorpe	64	30	6	—	94
MIDLAND COUNTIES	Warwick, Broseley, Retford, Cirencester, Watlington, and Newport Pagnell.	67	25	8	—	92
ENGLAND, S.	Maidstone, Downton, Reading, Beenham, and Micheldever Station.	58	35	7	—	93
SCOTLAND, W.	Ardwell, Islay, and Dumbarton	56	32	12	—	88
ENGLAND, N.W.	Leyburn	53	37	10	—	90
ENGLAND, S.W.	Glastonbury, Clifton, Tortworth	65	23	11	1	88
IRELAND, N.	Moynalty and Edgeworthstown	68	15	11	6	83
IRELAND, S.	Kilkenny and Ardfert	62	20	15	3	82
	Mean for all districts	61	28	10	1	89

TABLE II.—RETURN showing the NUMBER of FORECASTS sent to each of the under-mentioned PERSONS, with the SUCCESS or otherwise of the FORECASTS.

Districts.	To whom sent.	Addresses.	No. of Forecasts sent.	No. of Forecasts checked.	Per-centages.				Remarks.
					Complete Success.	Partial Success.	Partial Failure.	Total Failure.	
0. SCOTLAND, N.	Major Smith	Munlochy, Inverness	30	30	53·3	43·4	3·3	—	
	Rev. Dr. Joass	Golspie	30	30	66·7	23·3	10·0	—	
1. SCOTLAND, E.	C. Pirrie	Rothiemay, Huntly	36	36	44·5	33·3	22·2	—	
	T. Wilson	Glamis Castle, Glamis	30	30	56·7	40·0	3·3	—	
	T. Bett	Dalnaline, Aberfeldy	36	20	66·7	26·6	6·7	—	
2. ENGLAND, N.E.	Sir Jacob Wilson	Chillingham Barns, Northumberland.	60	44	66·7	24·3	9·0	—	Mr. D. H. Allen, for Sir Jacob Wilson, says, "more interest this year than any "previous year taken in the forecasts."
3. ENGLAND, E.	Sir J. B. Lawes, Bart.	Rothamsted, St. Albans	24	22	63·6	31·9	4·5	—	
	W. Birkbeck	High House, Thorpe, Norwich	30	30	63·3	30·0	6·7	—	
4. MIDLAND COUNTIES	Major Fosbery	Warwick	30	30	73·3	20·0	6·7	—	
	T. H. Thursfield	Barrow, Broseley, Shropshire	30	30	66·7	23·3	10·0	—	
	E. E. Harcourt-Vernon	Grove, Retford	30	30	66·7	23·3	10·0	—	
	Professor Hugo Ohm	R. Agricultural Coll., Cirencester	28	28	60·7	32·1	7·2	—	
	*J. Watson	Shirburn, Tetsworth, Watlington	36	36	63·9	25·0	11·1	—	
	*Rev. S. H. Williams	Newport Pagnell	40	40	67·5	27·5	5·0	—	
5. ENGLAND, S.	C. Whitehead	Barming House, Maidstone	36	36	66·6	27·8	5·6	—	Mr. Whitehead remarks, "the forecasts "as a whole during the hay season "have been very accurate, and more so "than they have ever been."
	E. P. Squarey	The Moot, Downton, Wilts	30	29	72·4	20·7	6·9	—	
	Martin J. Sutton	Kidmore Grange, Caversham, Reading.	42	42	66·6	23·9	9·5	—	
	*R. Webb	Beenham, Berks	37	36	44·4	47·2	8·4	—	
	T. Stirton	Stratton, Micheldever Stn., Hants	39	36	41·7	55·5	2·8	—	
6. SCOTLAND, W.	Sir M. J. Stewart, M.P.	Ardwell, Wigtownshire	30	30	56·7	30·0	13·3	—	
	J. S. R. Ballingal	Eallabus, Islay	30	30	53·3	33·4	13·3	—	
	W. Calder	Dalreock, Dumbarton	30	24	58·3	33·4	8·3	—	
7. ENGLAND, N.W.	G. W. Wray	Leyburn, R.S.O., Yorks	30	30	53·3	36·7	10·0	—	
8. ENGLAND, S.W.	R. Neville Grenville	Butleigh Court, Glastonbury	†	30	60·0	26·7	10·0	3·3	
	T. Dyke	Long Ashton, Clifton, Bristol	30	30	63·3	23·3	13·4	—	
	The Earl of Ducie	Tortworth, Gloucestershire	36	36	72·1	19·5	8·4	—	
9. IRELAND, N.	E. T. Farrell	Moynalty, Kells, Co. Meath	30	30	70·0	16·7	10·0	3·3	
	J. M. Wilson, J.P.	Currygrane, Edgeworthstown	30	24	66·7	12·5	12·5	8·3	
10. IRELAND, S.	Dawson A. Milward	Lavistown, Kilkenny	30	30	53·3	20·0	20·0	6·7	Mr. Milward says, "the forecasts have "been most valuable."
	W. Talbot Crosbie	Ardfert Abbey, Tralee	30	30	70·0	20·0	10·0	—	

* An asterisk is inserted against the names of those recipients who subscribed for the forecasts. † Sent through Agricultural Department.

Submitted—The following report on the forecasts issued at 8.30 p.m. daily during the month of February 1895 :—

The letters used have the following signification :—
a=complete success.
b=partial (*i.e.*, more than half) success.
c=partial failure.
d=total failure.

FEBRUARY.

Districts.		Per-centages. Wind.	Weather.	Average Forecast.	Per-centage of Success. a + b.
Scotland, N.	a	36	40	38	81
,,	b	46	39	43	
,,	c	4	14	9	
,,	d	14	7	10	
Scotland, E.	a	32	57	45	79
,,	b	46	22	34	
,,	c	11	7	9	
,,	d	11	14	12	
England, N.E.	a	32	36	34	73
,,	b	32	46	39	
,,	c	22	11	17	
,,	d	14	7	10	
England, E.	a	32	39	36	77
,,	b	46	36	41	
,,	c	11	14	12	
,,	d	11	11	11	
Midland Counties	a	25	36	31	75
,,	b	46	43	44	
,,	c	25	11	18	
,,	d	4	10	7	
England, S.	a	50	43	47	93
,,	b	43	50	46	
,,	c	7	4	6	
,,	d	0	3	1	
Scotland, W.	a	32	39	36	75
,,	b	39	39	39	
,,	c	18	4	11	
,,	d	11	18	14	
England, N.W.	a	29	36	33	63
,,	b	43	18	30	
,,	c	25	18	22	
,,	d	3	28	15	
England, S.W.	a	68	50	59	82
,,	b	32	14	23	
,,	c	0	18	9	
,,	d	0	18	9	
Ireland, N.	a	40	39	40	74
,,	b	39	29	34	
,,	c	14	25	19	
,,	d	7	7	7	
Ireland, S.	a	50	54	52	81
,,	b	32	25	29	
,,	c	14	11	12	
,,	d	4	10	7	
SUMMARY.					
British Isles	a	39	43	41	78
,,	b	40	33	37	
,,	c	14	12	13	
,,	d	7	12	9	

Mr. Scott reported that the copper-plate proving press (Minutes, p. 89) had been sold. He was instructed to offer one of the pantagraphs to the Science and Art Department, for their Loan exhibition.

Submitted—The following as the result of the primary checking of the storm warnings issued to the coasts of the British Islands since the last meeting of the Council :—

WARNINGS ISSUED.

The signals were hoisted on 1 day, the number of districts warned being 4. In 3 districts the warnings were justified, but in 1 they were not required.

GALES EXPERIENCED, BUT FOR WHICH NO WARNING WAS ISSUED.

None.

(Signed) FREDC. GASTER.

Telegraphic Branch,
20th March 1895.

Submitted—The following statement of accounts :—

	£	s.	d.
Cash balance on 5th March - - - -	3,872	19	10
Receipts from 6th to 19th March - - -	128	8	3
	4,001	8	1
Cheques drawn from 6th to 19th March - -	228	5	5
	£3,773	2	8

Submitted—The following list of publications which had been received since the last Meeting :—

La Guardia, Observatorio Meteorológico del Colegio de la Compania de Jesús.—Cuadernos publicados, No. i. Resumen de las observaciones meteorológicas efectuadas en el Colegio de La Guardia, durante el decenio de 1881 à 1890.

—— —— Cuadernos publicados, No. iii. Contiene 1°. Un estudio acerca del agua meteórica. 2°. Nota sobre la temperatura en el año 1893. 3°. Las observaciones meteorológicas de los años 1892 y 1893.

Pernter, J. M.—Die Wolken.

—— Die Niederschlagsverhältnisse der Umgebung von Bozen in den Jahren 1891–1893.

—— Zur Erklärung des täglichen Ganges der Windgeschwindigkeit.

—— Meteorologische Beobachtungen an der K.K. Universität Innsbruck, 1891, 1892.

Buchan, A.—Report on oceanic circulation. Appendix (Part viii.) to Report on the scientific results of the voyage of H.M.S. "Challenger."

London, Admiralty, Hydrographic Office.—Catalogue of Admiralty charts, plans, and sailing directions, 1895.

Upsala, Observatoire Météorologique.—Bulletin mensuel. Vol. xxvi., 1894.

Manila, Observatorio Meteorológico.—La meteorológia en la Exposición Colombina de Chicago, 1893. Memoria escrita por los PP., F. Faura y J. Algué.

Greenwood, W. N.—Greenwood's nautical almanac, general and coasting kludonometric tide tables, 1895.

Garrigou-Lagrange, P.—Relations nouvelles entre les mouvements barométriques sur l'hémisphère nord et les mouvements en déclinaison du soleil et de la lune.

Arcimis, A.—La circulación atmosférica.

Berlin, Deutsche Meteorologische Gesellschaft.—Berliner Zweigverein der deutschen meteorologischen Gesellschaft. xii. Vereinsjahr, 1895

Rio Janeiro, Observatorio.—Annuario. 1894.

Tyrer, R.—The meteorology of Cheltenham, 1894.

Clyde, E. E.—Meteorological observations at Tavistock for 1894.